

ABSTRACT

Title of Document: MATURITY IN READING, REVISITED: A
CLOSER LOOK AT ADULT COMPETENT
AND MATURE READING

Emily Fox PhD 2012

Directed By: Professor Patricia A. Alexander, Department of
Human Development

This study investigated the nature of higher-level reading development in adults. Theories of reading development vary in what they identify as the desired endpoints of reading development, with one key difference being whether reading is fundamentally seen as instrumental for accomplishing tasks or as a mode of personal growth. Difficulties associated with understanding higher-level reading development from the point of view of reading as essentially instrumental include the conflict between understandings of higher-level reading development as increasingly specialized and understandings of higher-level reading development as involving consistency of reading performance, even in situations of low knowledge or interest.

Gray and Rogers (1956) conducted a study of maturity in reading in which they considered the full flowering of the potential of reading to be the engagement in reading as a form of self-development. This study revisited Gray and Rogers's investigation and expanded upon it by including additional relevant aspects of reading maturity derived from consideration of other theories of reading development and the

theoretical and empirical literature on higher-level reading development and by focusing on graduate students as competent and potentially mature readers.

The current qualitative, descriptive study aimed at seeing what shape mature and competent reading take with regard to the associated experiences, habits, perceptions, ideas, attitudes, behaviors, and cross-situational reading performance of adult readers with strong academic experience and active regular experience of challenging, specialized reading. Reader profiles were created that highlighted aspects of the data that distinguished possible reading maturity, and three individual and more elaborated exemplary case studies were developed based on those profiles. Finally, descriptions of the underlying phenomena of reading maturity and reading competence were developed.

Reading maturity was seen to have the essential character of critical openness, to pursue reading for self-development, and to involve a unified view of reading. Reading competence was seen to have the essential character of being schooled, to pursue reading for task-completion or escape, and to involve the dichotomization of reading into effortful, information-gathering reading of nonfiction for school and pleasurable, entertainment-seeking reading of fiction for personal purposes. In addition, reading competence was seen to take two forms, a generalized cross-situational reading capability, and a situationally-reliant reading that depended on familiarity and interest to support successful reading. This latter form was also connected to the high competence associated with expertise.

MATURITY IN READING, REVISITED: A CLOSER LOOK AT ADULT
COMPETENT AND MATURE READING

By

Emily Fox

Dissertation submitted to the Faculty of the Graduate School of the
University of Maryland, College Park, in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
2012

Advisory Committee:
Professor Patricia A. Alexander, Chair
Professor Peter Afflerbach
Professor Jonna M. Kulikowich
Professor Kathryn R. Wentzel
Associate Professor Min Wang

ACKNOWLEDGMENTS

I would like to express my profound gratitude to my advisor, Patricia Alexander, whose faith that I would actually one day finish this and that it was indeed worth doing was a continual source of encouragement. I am also indebted to the members of my dissertation and proposal committees: Peter Afflerbach, Jonna Kulikowich, Min Wang, Allan Wigfield, and Kathy Wentzel. Writing with the thought of them as readers was an invaluable spur toward clarity, accuracy, and honesty in what I thought and what I said.

My husband, John Fleming, and our children, Mark, Margaret, Annie, Charlie, Elizabeth, and Johnnie were tremendously supportive in innumerable ways, including going above and beyond the call of filial duty in helping with interrater reliability and with finding participants.

I would like to thank my fellow lab members in the Disciplined Reading and Learning Research Laboratory, Daniel Dinsmore, Emily Grossnickle, Alex List, and Liliana Maggioni, for their assistance with finding willing participants. The entire lab also was most helpful in giving feedback on my measures; they remain gracefully patient with my insistence that reading is in fact the most important thing there is. The ideas that are forwarded here have benefited from many peripatetic conversations with Liliana; I look forward to seeing where we go next with our ideas about reading and learning from text.

I am grateful also to our department's Graduate Coordinator, Eileen Kramer, who was patient and understanding in guiding me through the process and paperwork involved.

Finally, I would like to take this opportunity again to note my indebtedness to William Gray, whose writings about reading have been a delight, a comfort, and an inspiration.

TABLE OF CONTENTS

Table of Contents	iv
List of Tables	ix
Chapter 1: Introduction	1
Statement of the Problem.....	4
Purpose of the Study.....	5
Research Questions and Analysis.....	5
Definition of Terms.....	6
Assumptions.....	7
Significance of the Study.....	7
Chapter 2: Literature Review	10
Perspective on Reading.....	10
Reading as Complex.....	14
Layered.....	14
Interactive.....	15
Dynamic.....	16
Messy.....	17
Reading as Communicative.....	17
Collaborative.....	19
Interpretive.....	20
Evaluative.....	20
Reading as Contextually Anchored.....	21
Setting.....	22
Construction.....	24
Reading as Purposeful.....	26
Interest.....	28
Epistemic orientation.....	29
Reading identity.....	30
Goals.....	31
Reading as Transformative.....	32
Experience-dependent and experience-building.....	34
Assimilative and accommodative.....	36
Powerful.....	38
Theories of Reading Development.....	43
Gates: Refinement of Techniques.....	52
Theory and its context.....	52
Developmental mechanisms.....	53
Environmental encounters.....	54
Aspects of reading, relation to wider development, ultimate aim.....	54
Related view.....	55
Difficulties with narrowness.....	57
Gray: Growth Toward and Through Maturity.....	57

Theory and its context.....	57
Environmental encounters	58
Aspects of reading	59
Developmental mechanisms	59
Ultimate aim, relation to wider development	60
Maturity in reading	61
Related view.....	63
Areas for further specification	64
Gibson and Levin: Adaptiveness and Economy	65
Theory and its context.....	65
Developmental mechanisms	67
Aspects of reading, ultimate aim	68
Environmental encounters	69
Relation to wider development	70
Disconnection problems.....	71
Chall: Accommodation to New Problem-Solving Tasks.....	72
Theory and its context.....	72
Developmental mechanisms	76
Environmental encounters	77
Aspects of reading.....	78
Relation to wider development	79
Ultimate aim.....	80
Endpoint and other problems	81
Alexander: Progression Toward Domain Expertise	83
Theory and its context.....	83
MDL and reading.....	87
Developmental mechanisms	89
Environmental encounters	90
Aspects of reading.....	91
Ultimate aim.....	91
Relation to wider development	91
Domain-related complications	93
Looking Across the Theories	101
Highest stages	101
Aspects of reading addressed.....	103
Mechanisms of growth.....	104
Environmental interactions	107
Development as a reader.....	108
Aim of reading development	109
Reading Maturity	111
Conceptualizations of Reading Maturity	114
Scardamalia and Bereiter: Knowledge-transforming.....	114
Pressley and Afflerbach: Constructive responsiveness.....	117
Geisler: Socialization into a cultural practice	121
Gray and Rogers: Eager, effective, independent participation	125
Investigations of Reading Maturity	127

Expert reading	128
Reading competency	133
Expertise and competency	138
Reading approach.....	144
Reading as a behavior	154
Building Upon the Literature	157
Perspective on Reading.....	158
Theories of Reading Development	159
Conceptualizations and Investigations of Reading Maturity	161
Chapter 3: Methodology	164
The Pilot Study	164
Purpose.....	164
Participants.....	165
Measures and Procedure	165
The Study	169
Design	169
Participants.....	174
Measures	181
Demographics	182
Structured interview.....	182
Evaluation of knowledge/interest for passage topics.....	186
Passage knowledge pre-assessment	188
Encyclopedia entries	188
Passage think-alouds.....	192
After-reading tasks and questions.....	194
Post-task interview.....	197
Procedures.....	197
Chapter 4: Data Analysis	199
Overview.....	199
Demographics	205
Age.....	205
Years of graduate study	205
Area of study.....	206
Structured Interview.....	207
Learning to read	211
Reading in and out of school	212
Change as a reader	215
Current reading habits.....	216
Interest in reading/Importance of reading.....	219
What happens during reading	220
Reading-related knowledge	221
Good reading.....	222
Self-description as a reader	223
Approach to reading.....	225
Goals when reading.....	226
Knowledge pre-assessment.....	227

Coding.....	227
Validation provided	228
Think-alouds	230
Coding.....	230
Use in reader profiles	233
Outcomes	235
Main idea	235
Learning	236
Reliability.....	238
Presentation.....	240
Follow-up Interview.....	240
Chapter 5: Results	242
Overview	242
Reader Profiles.....	245
Exemplar Cases.....	251
Frances: "I am fearless"	252
Frederick: "If it's in a book I can read it and get it and then it's mine"	263
Benjamin: "What can I write about that would be smart?"	272
Describing the Phenomenon	281
Reading maturity.....	284
Reading competence	290
Chapter 6: Discussion	296
Findings.....	296
Data types.....	298
Participants.....	300
Describing higher-level reading development	301
Limitations	303
Boundedness	304
Generality vs. particularity.....	306
Exhaustiveness, completeness, reliability, and validity	308
Significance.....	309
Practical implications.....	310
Theoretical contributions	315
Directions for future research	321
Appendices	326
Appendix A: Demographics	326
Appendix B: Structured Interview	328
Appendix C: Reader Profile Descriptions.....	332
Appendix D: Knowledge and Interest Evaluation	335
Appendix E: Sample Passage.....	345
Appendix F: Encyclopedia Entries	348
Appendix G: Knowledge Pre-Assessment.....	429
Appendix H: Think-Aloud Instructions	430
Appendix I: After-reading Tasks	434
Appendix J: Post-Reading Interview Questions	435
Appendix K: Reader Profiles on Dimensions of Maturity.....	436

Appendix L: Coding Schemes for Structured Interview Data	461
Appendix M: Examples of Codings for Knowledge Pre-Assessment	489
Appendix N: Codes for Think-Alouds.....	491
Appendix O: Codes and Examples for Outcomes for Q2 - Learning	505
Appendix P: Codes and Examples for Outcomes for Q3 - Reliability	511
References	515

LIST OF TABLES

1.	Overview of Later Reading Development in Selected Theories	48
2.	Participants and Relevant Characteristics	179
3.	Distribution of Passages Across the Four Evaluative Categories	190
4.	Data Sources, Related Constructs, Use, and Coding	202
5.	Prior Knowledge Scores Across the Four Evaluative Categories	229
6.	Profiles for Exemplar Cases	254

CHAPTER 1

INTRODUCTION

As a society, we place great importance on reading. We rate our schools by how successfully they introduce our children to reading and carry our students along in developing as readers, even into high school, as mandated by the No Child Left Behind Act of 2001 (2002). Reading is seen as a key to academic and economic success (e.g., Snow, Burns, & Griffin, 1998), because it is used to accomplish valued academic and professional tasks. Reading is also seen as a form of cultural engagement (e.g., National Endowment for the Arts, 2007) and supportive of personal growth. The standards for what students should be able to do in the way of reading include goals related to excellence at both forms of reading (e.g., Common Core State Standards Initiative, 2010). However, it is not entirely clear how both involve the same understanding of what reading is, nor how both would be arrived at via the same developmental path.

To understand what we are undertaking when we seek to make our students into readers, it seems essential to consider our intended target. Without an articulated understanding of maturity in reading as the endpoint of a developmental trajectory in reading, how can we possibly expect to know how to guide our students at the beginning of their developmental path, or indeed at any point along that path?

Surprisingly, reading development has not often been described from such a long-term view. Although we accept the importance of learning to read well, and want all of our students to be able to read well, what that might mean once they are out of school is not often addressed (e.g., Conley, 2008). The idea that reading

development has connections to adult behaviors and outcomes is well-established, but most typically from the standpoint of avoidance of failure, or of bringing adults who are not successful readers up to speed (e.g., Brooks, 2010).

One striking example, striking because such considerations are rare in the reading literature, is the description of the proficient adult reader offered by the RAND Reading Study Group (RRSG; 2002) in their report on reading comprehension:

proficient adult readers who can read a variety of materials with ease and interest, can read for varying purposes, and can read with comprehension even when the material is neither easy to understand nor intrinsically interesting. (p. xiii)

This type of understanding of good adult reading resonates with our assessment practices. We expect readers to show competence by comprehending whatever they are given to read, as long as it is appropriate for their developmental level. However, there is also an alternative understanding of good adult reading that focuses on how experts in a particular subject area read in that subject area (e.g., Pressley & Afflerbach, 1995); in this case we expect readers to show excellence in reading only very specific materials in a very specific way. This type of understanding of good adult reading fits with our conceptions of content area literacy and what it means to learn to read and learn by reading in a subject area (e.g., C. Shanahan, 2009). Which of these should be what we aim our reading students toward? Do they mean the same thing as endpoints of reading development? And where is cultural engagement and personal growth?

A few theorists have offered models of reading development that chart the reader's developmental path from early reading or pre-reading through adulthood and maturity in reading. Gates (1947); Gray (1925a, 1937; Gray & Rogers, 1956); Gibson and Levin (1975); Chall (1983); and Alexander (1997, 2003a, 2003b, 2006) have presented their understandings of what reading development looks like from childhood on. Each of these theories offers a different view of the ultimate aim of reading development and of the nature of reading, which leads to the projection of different paths for readers as they mature and different portraits of the mature reader.

In each of the theories, readers become more independent, adaptive, and flexible in successful reading to accomplish the tasks they are presented with in school, that is, they develop a general competence in reading. In two of the theories, the development of subject-matter specialization of expertise is also considered important for the arrival at full maturity in reading (Alexander, 1997, 2003a, 2003b, 2006; Chall, 1983). In only one of these theories is the path to full maturity in reading seen to involve both in-school *and* out-of-school reading, both accomplishment of tasks *and* personal growth, and the arrival at full maturity in reading viewed as becoming apt and able to engage in reading as a form of self-development (Gray, 1925a, 1937; Gray & Rogers, 1956).

The breadth of Gray's view of reading offers great potential for generating a clearer understanding of the endpoints of reading development within which to address issues such as the divergence between the views of excellent adult reading as a general competence and as a form of expertise. The current study builds upon a study of reading maturity by Gray and Rogers (1956) in order to more fully specify

key aspects of reading maturity and its possible precursor or alternative developmental endpoint of reading competence.

Statement of the Problem

The current study expands upon the study of reading maturity by Gray and Rogers (1956) by extending the types of data collected to create case studies and reader profiles, and by sampling a particular population of presumably competent and possibly mature readers: graduate students. Additional types of data to be collected beyond those obtained by Gray and Rogers (1956) include think-aloud data enabling the observation of the reader's behaviors during reading. Reading performance will be observed across reading situations varying in the reader's level of topic knowledge and topic interest, with passages matched to the reader. Additional interview data will be collected related to readers' understandings of reading, their knowledge of reading, and their views of themselves as readers, which enable the exploration of the importance of these factors, identified as important in more recent research related to reading competence and maturity. The qualitative, descriptive portraits of reading maturity and reading competence that will be generated in the collective case study approach used have the potential to untangle a number of confusions evident in the theories of reading development and investigations of reading maturity. The understanding of reading maturity is at the core of the enterprise of enabling, encouraging, and educating children to read, and it is very important to be clear on what is at stake.

Purpose of the Study

The current study seeks to investigate mature or competent adult reading by building upon Gray and Rogers's earlier study of maturity in reading (1956). The study has one main goal, which is to see what shape mature or competent reading takes with regard to the associated experiences, habits, perceptions, ideas, attitudes, behaviors, and outcomes of adult readers.

Research Questions and Analysis

The research question addressed in this study is:

What does *maturity in reading* from the perspective of Gray's theory of reading development look like when the additional aspects of readers' behaviors during reading, readers' understandings of reading, readers' perceptions of themselves as readers, and readers' performance under conditions of varying levels of topic knowledge and topic interest are incorporated into its description?

The creation of a description of maturity in reading requires the discrimination of maturity in reading and competence in reading. Therefore, as a corollary to this primary research question, the current study also investigated the associated question:

What does *competence in reading* from the perspective of Gray's theory of reading development look like when the additional aspects of readers' behaviors during reading, readers' understandings of reading, readers' perceptions of themselves as readers, and readers' performance under conditions of varying levels of topic knowledge and topic interest are incorporated into its description?

The analysis follows the case study, profile-building approach used by Gray and Rogers (1956). This type of descriptive, qualitative approach is a collective case study, "where a researcher investigates numerous cases to study a phenomenon, group, condition, or event" (Barone, 2004, p. 9). In this instance, the phenomenon under investigation is higher-level reading development, in particular, maturity and competence in reading.

The meanings of different types of responses for the criterial variables with regard to level of reading development are to be determined by reference to both a priori standards derived from the literature (or from Gray and Rogers's procedure) and the nature and range of what is seen in the data collected. On the basis of these determinations, profiles will be constructed for participants with regard to where they stand on each of these criterial aspects. These profiles will provide the supporting data for cross-case comparison and pattern detection related to the phenomenon investigated. The patterns detected will be further elaborated and validated by the creation of a set of three individual case studies, exemplar portraits of instantiations of reading competence and reading maturity as seen in this group of readers. Finally, these patterns will be incorporated in elaborated descriptions of these two modes of higher-level reading development and the role in them of the reading-related experiences, habits, self-perceptions, understandings, behaviors, and cross-situational performance of adult readers.

Definitions of Terms

Reading is the complex communicative behavior of deriving meaning from presented text (Fox & Alexander, 2011).

Learning to read is becoming able to participate in the behavior of reading in ways that support one's purposes and satisfy one's needs (Fox & Alexander, 2011).

Reading competence is the level of reading development at which readers can read and understand what is presented in text even when the material might be difficult, unfamiliar, or uninteresting (Alexander, 2003b; RRSB, 2002).

Reading maturity is the level of reading development at which readers read competently for self-directed growth through their communicative, collaborative, interpretive, and evaluative encounters with text (Gray & Rogers, 1956).

Self-development is the effort toward personal growth through increasing the scope and quality of one's understandings of oneself, of others, and of the natural world (purposes for reading 11, 12, and 13, Gray & Rogers, 1956, p. 93).

A *collective case study* is a particular mode of case study research involving the qualitative, descriptive investigation of an overarching phenomenon through the observation and comparison of multiple relevant cases (Barone, 2004).

Assumptions

The following are guiding developmental assumptions informing this study:

- reading development does progress toward a highest form, namely, maturity;
- reading maturity is in fact the highest form of reading development, meaning that it is taken to be in some sense "better than" those preceding it;
- reading competence is a precursor or prerequisite of reading maturity.

Significance of the Study

In the enterprise of teaching children to read, one of the avenues researchers have followed has been the investigation of how skilled readers behave. The

presumption is that if common elements of the performance of skilled or expert readers can be determined and then taught to beginning or novice readers, the beginners will progress more effectively toward becoming expert readers themselves. For example, results from such research on skilled reading have made their way into the classroom in the form of comprehension strategy instruction, with recommendations from researchers that students be instructed in how to monitor, regulate, and move forward their understanding of written text using strategies derived from the study of skilled reading behavior (Duffy, 2002; Paris, Lipson, & Wixson, 1994). However, the specifics of the developmental path connecting beginners and more mature readers are not often considered; when they are, a number of complications arise, in regard to what students need to be doing in the way of reading, what they need to be learning about reading, how they should be thinking about reading, and how all three of these relate more broadly to learning in general.

The current study aims to untangle some of these complications by more broadly situating its investigation of higher reading development within a view of reading as a complex communicative behavior developing across the lifespan. It takes into account how higher reading development has been considered within theories of reading development, and how reading maturity has been conceptualized and investigated theoretically. Those conceptualizations and investigations inform this study in its revisiting of an investigative path previously trodden by Gray and Rogers (1956).

The current study provides theoretically coherent and empirically justifiable elaborated descriptions of the nature of reading maturity and reading competence that

illuminate the role in higher reading development of the specific aspects of reader knowledge, interest, behaviors, understandings, and perception identified as important in the literature. The significance of these findings lies, first, in their potential to support the value of adopting the broad perspective on reading taken here. Secondly, they can be taken back to the literature on conceptualization and investigation of reading maturity to see where the complications that arose might begin to be understood as part of a larger story or picture of reading development. To this end, it is critical that the findings have both theoretical coherence and the empirical support provided by observation and analysis of data from actual readers. Lastly, they can serve as a starting point for a renewed discussion of the meaning of reading development, and of our educational goals with regard to reading maturity.

"If you don't know where you're going, you're probably going wrong."

(Pratchett, 2010, p. 351)

CHAPTER II

LITERATURE REVIEW

This chapter sets out a framework within which to investigate the nature of maturity in reading. Rather than aiming at exhaustiveness, this review follows the approach suggested by Maxwell (2006) in using the criterion of relevance, specifically relevance to the establishment of a framework and rationale for the current study.

The line of argument is as follows. The first section establishes the broad context for the study, in discussing the necessity for explicit consideration of the perspective taken on reading and outlining the perspective that is adopted here, of reading as a behavior and as developing across the lifespan. The second section addresses relevant theories of reading development, given that perspective on reading, in order to consider what the trajectory of higher reading development could be, with particular attention to transitions into and within the highest stages of reading. The third section considers reading maturity, addressing how it has been conceptualized and the types of empirical investigations and findings that have emerged in the literature. What mature or highly competent readers know and can do, and how their reading experiences and perspectives may be related to their active, interested, and successful reading even in challenging low-knowledge, low-interest reading situations is the focus of the current study.

Perspective on Reading

Reading has been viewed from a variety of perspectives by educational and developmental researchers. Alexander and Fox (2004), in their discussion of

historical perspectives on reading, considered changes in views of learning and the learner over the past fifty years. They marked in particular the transitions from a focus on learning as conditioned behavior, to learning as a natural process, to learning as a form of information processing, to learning as nested in a sociocultural context, up to the current focus on learning as involving motivated engagement. Different views of the learner entail specific consequences for the perspective adopted by researchers and practitioners, which then influences the questions asked and the methodology used to investigate them (Marton & Svensson, 1979). However, because the field tends to work within the frame afforded by the currently dominant perspective, it can be difficult to see how such a perspective can constrain our thinking about reading.

Although in the historical review by Alexander and Fox (2004), reading research was held to have moved beyond the information-processing perspective dominant in the 1970s to include consideration of context, social interaction, and motivation, the underlying conception of reading as primarily a problem-solving information-processing activity still remains strong (Fox & Alexander, 2009). Motivational, social, and contextual aspects have been grafted onto this cognitively-oriented view of reading as processing, but the integration of these multiple aspects in thinking about reading and investigations of reading is still problematic, as noted in Duffy, Israel, and colleagues' (2009) overview of trends and issues in recent reading comprehension research and theory.

While the positioning of cognitive processing as fundamental has enabled us to learn a great deal about reading as processing, it is nonetheless a narrowed view

that can become a limitation when we find (as we do) that we need to consider larger motivational, social, and contextual aspects. Fox and Alexander (2009) have called for a reconceptualization of reading comprehension and a move beyond the view of reading as constructive-integrative cognitive processing. They argued that what is called for is not the belated re-acknowledgment of additional aspects of reading to be attached somehow to the underlying cognitive processing apparatus, but a more fundamental shift in how reading is viewed. One way to consider what it means to have developed a better understanding of a phenomenon is to look at the degree to which a previously undifferentiated and inclusive whole has become complex and specific (Marton & Booth, 1997). The proposed shift in perspective on reading is, in a sense, a return to a view of reading as a whole, but a whole that has become increasingly differentiated through the efforts of researchers who have concentrated on parts or aspects of that whole (Alexander & Fox, 2004; Fox & Alexander, 2009).

Following that line of thinking, this study is, therefore, grounded in a perspective on reading as a human behavior (Russell, 1961) that develops across the entire lifespan (e.g., Strang, McCullough, & Traxler, 1955). Taking reading as a behavior is, on the one hand, a matter of embedding reading essentially in context: reading is a meaningful and organized response to and interaction with the environment (Russell, 1961). On the other hand, taking reading as a behavior is an issue of level of analysis: reading is considered to be the very doing of reading as part of going about the business of being a (literate) human being (e.g., Gray, 1940). Other aspects of reading that might be investigated become just that, aspects of

reading, which carry meaning about reading only insofar as they are traceable back to this larger frame.

The lifespan developmental aspect of this perspective follows from the consideration of reading as a behavior, in that while engaging in the behavior of reading as part of going about the business of living, we continue to develop as readers, just as we continue to grow as human beings. As Gray and Rogers stated, “reading maturity must be conceived in close relationship to general maturity” (1956, p. 55), with both forms of maturity being marked not just by completion of particular developmental tasks but also by continued potential for growth and development, such that “in the satisfaction of interests and needs through reading, a mature reader will continue to grow in capacity to interpret broadly and deeply” (Gray & Rogers, 1956, p. 56).

This perspective positions our thinking of reading as beginning from reading as a complex and integrated phenomenon, within which particular perceptual, physiological, cognitive, motivational, social, contextual strands or combinations thereof might then be foregrounded and traced. Further, this perspective on reading allows for relevant contributions from multiple disciplines addressing human communicative behavior and lifespan development, including sociology, linguistics, and psychology. And finally, this perspective on reading constructs a space for discourse about reading within which it is appropriate to consider both observational and experiential orientations toward the reader, to capture reading with both quantitative and qualitative descriptions, to conceptualize reading as both contextual and generalized, to aim both at discovering relations between variables and at

determining the meanings of the variables, and to direct our research toward both explanatory and emancipatory applications (Marton & Svensson, 1979).

In this view of reading as a behavior that develops across the lifespan, reading is characterized as essentially complex, as communicative, as contextually anchored, as purposeful, and as transformative. It is defined as “the complex communicative behavior of deriving meaning from presented text,” and learning to read is defined as “becoming able to participate in the behavior of reading in ways that support one’s purposes and satisfy one’s needs” (Fox & Alexander, 2011). Each of these aspects of this characterization of reading will be discussed briefly. It is important to establish at the outset that although they are treated here separately, they are bound up together in this perspective on reading, and reflect the consideration of different aspects of reading rather than its dissection into parts.

Reading as Complex

The complexity of reading is challenging to describe and to capture. Gibson and Levin (1975), in summing up their discussion of models of the reading process, arrived finally at the conclusion that “the reading process is rule-governed and incapable of adequate description in simple terms” (p. 482). One way to address the description of reading’s complexity is to consider reading as layered, interactive, and dynamic (Fox & Alexander, 2011), while capturing the complexity of reading is here built around an acknowledgement at the outset of the inherent messiness of reading considered as a behavior (de Beaugrande, 1981).

Layered. Reading can be viewed as involving the layering of multiple complex systems, including perception, cognition, and motivation. The idea of

layering is intended to suggest the simultaneous and contiguous presence of distinct components that can be considered independently in a meaningful way. Most typically, the cognitive systems of reading processes have been singled out for independent consideration when investigating reading. However, even isolating just the cognitive processing involved in the specific activity of text comprehension does not achieve an easily manageable level of complexity. Goldman, Golden, and van den Broek (2007) mentioned this in their discussion of the usefulness of computational models of reading: “describing the psychological processes involved in text comprehension is complicated because a large number of cognitive systems are involved” (pp. 28-29). The difficulty presented by the need to take account of multiple types of processes was also identified by Kintsch and Yarbrough (1982) in regard to the assessment of text comprehension: “ ‘comprehension’ is a commonsense term for a whole bundle of psychological processes, each of which must be evaluated separately” (p. 834).

Interactive. Reading involves the interaction of multiple factors arising from multiple sources, including text, reader, activity, and context (e.g., RRSB, 2002), as well as interactions within and among the layered systems identified above (e.g., Spiro, Bruce, & Brewer, 1980). Considering reading comprehension in particular, the RRSB (2002) identified the reader, the text, and the purpose for reading as the three interactive elements composing reading comprehension, and further specified that their interactions occur within and interact bi-directionally with the sociocultural context. The nature of any reading event is distinctively determined by what the reader brings in the way of interests, attitudes, knowledge, and skills (e.g., Fox, 2009;

Gray & Rogers, 1956; RRSg, 2002), by the text being read, and by the type of reading being undertaken and the purpose for reading, all of which are bound up with the larger sociocultural context (RRSG, 2002). As Gibson and Levin (1975) put it, “No single model will serve well to describe the reading process, because there are as many reading processes as there are people who read, things to be read, and goals to be served” (p. 454).

Dynamic. Reading involves the on-going and dynamic responsiveness of these layered systems and interactive factors within and among themselves. There are multiple levels of and timescales for this dynamic responsiveness, which occurs not only at the grain-size of the shifts and adaptations underway during a given reading event but also incrementally and cumulatively over a lifespan. Gibson and Levin (1975) observed the responsiveness of the reader to the circumstances of a particular reading event: “The first thing to emphasize is that reading is an adaptive process. It is active and flexible, the processing strategies changing to meet the demands of the text and the purposes of the reader” (p. 482). The idea of the reader being tuned over time and with exposure to relevant regularities is present in a number of accounts of reading development (e.g., Chall, 1983; Gibson & Levin, 1975). Such tuning occurs not only at the level of the automation of basic reading processes, as in descriptions of the development of word recognition (e.g., Adams, 1990), but also, for example, at the level of constructive responsiveness in deriving meaning.

The claim is made that constructively responsive reading represents many years of readers' varied experiences and practice in constructing meaning from demanding texts. (Pressley & Afflerbach, 1995, pp. 83-84)

Messy. Beyond these forms of complexity, the nature of reading as contextually anchored, communicative, and purposeful entails additional levels of complexity for researchers in the need to consider actual contexts, communicative paradigms, and reader goals. Reading as a behavior is messy and noisy to analyze (de Beaugrande, 1981), but in this perspective on reading, pursuing the questions that are worth asking means taking reading in all its messiness, noisiness, and complexity. Following Neisser (1976), this perspective on reading aims at making provisional and incremental steps toward a better understanding of reading in terms of its many, various, and interconnected ecologically significant variables, rather than restricting the scope of research to what is tidy and tractable.

Reading as Communicative

Reading is inherently language-based and is inherently communicative and social in nature. It is often convenient when investigating reading to consider the text as a ready-made object, a particular kind of stimulus that happens to be present in the environment. An extreme example of the approach to text as ready-made is the creation of what Graesser, Millis, and Zwaan (1997) referred to as textoids:

Experimenters carefully craft texts to manipulate independent variables, control for extraneous variables, and satisfy counterbalancing constraints. We call these experimenter-generated materials "textoids" because they are not naturalistic discourse segments that are written to convey an informative or

interesting message to a comprehender. (p. 165)

Such an approach to text bypasses the social interchange that is at the heart of reading. Reading is not simply an interaction with a printed page, just as getting a telephone message is not simply an interaction with a telephone receiver. Reading is a communicative interaction between people through the medium of text. Voss and Bisanz (1985) addressed this point well:

First, text processing is generally viewed in terms of the interaction of the language stimulus and the individual's knowledge. In fact, it involves the interaction of two individuals. As is frequently stated, language is a medium of communication. The linguistic influence in psychology, while having many positive ramifications, has perhaps produced too much of an emphasis upon language as a set of complex stimulus materials and not enough upon the fact that language is generated by individuals, and that comprehension involves not simply "language understanding" but language understanding in the context of the goals and particular modes of expression used by the individual generating the passage. (p. 194)

Together, reading and writing allow the interchange of even complicated arrangements of ideas and arrays of information across the barriers of distance and time (Montessori, 1962/1972; Russell, 1961). As a communicative behavior, reading is collaborative and interpretive, and evokes its own distinctive discourse pragmatics by means of which the collaborative and interpretive derivation of meaning from a text is guided (Mey, 2003). And as a communicative behavior, reading also carries

with it the potential for judgment or evaluation on the part of the reader (Fox, 2009; Meyer, 1987; Pressley & Afflerbach, 1995).

Collaborative. The success of reading as a communicative behavior rests upon a more or less explicit projective (for the author) and retrospective (for the reader) collaboration, just as the success of oral communication depends upon a mutual effort toward shared meaning-building between speaker and hearer (Grice, 1975). In his discussion of literary pragmatics, Mey (2003) highlighted this collaborative interaction: "It is only through an active cooperative effort, shared between reader and author, that the interplay of voices can be successfully created and recreated. Reading is a *cooperative act*" (p. 798, emphasis in the original).

This cooperation begins at the very basic, socially negotiated level of use of the alphabetic symbol-system and adoption of standard conventions of print, such as left-right directionality and use of punctuation (e.g., Clay, 1989; Johns, 1980). In the mutual effort after shared meaning, one of the available tools for the reader is the consideration of what the originator of the text may be trying to get across and why (Meyer, 1987; Shanahan, 1992; Tierney, LaZansky, Raphael, & Cohen, 1987), while the author, in turn, can attempt to anticipate and assist the reader's efforts (Tierney et al., 1987). The collaborating partners in reading are typically separated by time and distance, which makes the effectiveness of the author and the reader in anticipating one another's responses and intentions particularly critical. The author makes choices intended to facilitate anticipated uses of text, and the reader's tuning into those aspects of intended facilitation supports successful uses (Center, 1952; Meyer, 1987; Tierney et al., 1987). As Mey (2003) observed, "The work that the author has done in

producing the text has to be supplemented and completed by you, the reader” (p. 788).

Interpretive. Collaboration of some kind between author and reader is necessary because of the inherent ambiguity and multiplicity of possible meanings present in any text: “In general, neither the original text nor a person’s understanding of it is unambiguous” (Kintsch & van Dijk, 1978, p. 378). The reader’s derivation of meaning from presented text requires constructive interpretation at every layer. There is no direct access to or extraction of meaning; rather, we are always interpreting, even at the level of perception (e.g., Bartlett, 1932/1995; Neisser, 1967).

The interpretive nature of reading, particularly with regard to the meaning-deriving aspect of comprehension, has been recognized from the earliest days of reading research (e.g., Thorndike, 1917). To develop an understanding of a paragraph, Thorndike explained, the mind must “select, repress, soften, emphasize, correlate, and organize, all under the influence of the right mental set or purpose or demand” (1917, p. 329). The reader’s interpretive derivation of meaning is required for all texts, including “an explanatory or argumentative paragraph in his text-books on geography or history or civics” (Thorndike, 1917, p. 331) as well as texts typically considered to require more interpretive activity from the reader, such as poetry.

Evaluative. A further extension of reading’s communicative nature as a collaborative and interpretive derivation of meaning is the additional potential for reading to be evaluative (Fox, 2009; Pressley & Afflerbach, 1995). At the most basic level, the reader can evaluate the text’s truth or credibility, in whole or in part; the question is always there to be asked: Do I believe this? As Toulmin (1958/2003)

pointed out, “The man who makes an assertion puts forward a claim—a claim on our attention and to our belief” (p. 11), and part of the business of reading is to evaluate these claims. Center (1952) asserted, “The persuasive element, in varying degrees, is always present in whatever an author writes and publishes” (p. 41), and even authors of fiction seek to elicit the reader’s assent to the reality, believability, or relevance to the human experience of the situations, behaviors, and characters being presented (Mey, 2003). In addition to determination of truth value, the reader can also take notice of how well the author is performing in anticipating and supporting the reader’s derivation of intended meaning and use of the text (Mey, 2003; Pressley & Afflerbach, 1995; Tierney et al., 1987).

Evaluation of the truth of the text can be based upon explicit comparison to the reader’s own knowledge or upon a more implicit and often more affective response, as well as upon consideration of the author’s credibility and authority (Mey, 2003; Pressley & Afflerbach, 1995). Principled, critical evaluation of text is often positioned as appropriate to readers at higher stages of reading development (e.g., Chall, 1983). However, as arising from the nature of reading as communicative, evaluative response is the prerogative of all readers; when such evaluation is framed as critical reading, it has even been viewed as obligatory for all readers (e.g., King, 1967).

Reading as Contextually Anchored

Taking reading as a behavior involves considering reading as an individual’s response to and interaction with certain aspects of the environment (Russell, 1961). Reading is thus essentially located in an environmental context. In addition to

context as a broadly framed location or setting within which reading occurs (e.g., RRSg, 2002), there is a perception or interpretation of context in multiple senses actively constructed by the reader while engaged in the meaning-derivation process (van Dijk, 1999). In this perspective, therefore, not only is reading viewed as embedded *in* a context, but it is also seen as involving construction of context by the reader.

As Neisser (1976) noted with regard to the general issue of ecological validity in psychological research, while it is necessary and important to take account of context, a vague and general call to attend to context is not likely to be helpful. Rather, the specific aspects of context considered likely to impinge upon the process, activity, or behavior being studied must be highlighted and addressed:

The situations of everyday life differ widely from one another; which one is to be imitated? Demands for ecological validity are only intelligible if they are specific. They must point to particular aspects of ordinary situations...and there must be good reason to suppose that those aspects are important. (p. 34)

However, it should also be borne in mind that every determination of relevant aspects of context by the researcher or by the reader is a selection governed by specific purposes or intentions, and that different purposes or standpoints typically dictate a different selection of relevant contextual features (Kulikowich & Alexander, 2010).

Setting. As has long been recognized by reading researchers, reading happens differently in different contexts: “The nature of the reading act changes with the various settings in which it may occur” (Russell, 1961, p. 119). Some aspects of context connected with different reading behaviors by early researchers included

formal versus informal testing (Gray, 1920), different types of teaching methodologies, reading materials, and student expectancies (Judd & Buswell, 1922), and amount of background noise and distraction (Strang, 1938).

The germane aspects of what is taken to be the setting for reading will differ depending on what is being investigated in terms of reading behavior and the associated focal orientation of interest. For example, in her case study of a student's development as a rhetorical reader in biology, Haas (1994) focused on those elements of the student's learning environment that constituted the disciplinary setting for her rhetorical reading development, including forms of textual discourse encountered, academic tasks involving reading, classroom instruction and activities, and actual engagement in the work of biology in a laboratory.

Another possible standpoint is that of the normative or typical reader (e.g., Gray, 1949; Kintsch & van Dijk, 1978) or the consideration of critical dimensions along which readers can vary (e.g., Daneman, 1991). Here the context tends to operate as a relatively well-defined menu of independent variables, the scope of which can expand or contract depending on the particular explanatory boundaries adopted. For example, Daneman (1991) laid out the boundaries for her discussion of individual differences in reading from an information-processing perspective as including perceptual and cognitive (but not motivational) factors contributing to differences in speed and accuracy of reading for readers who were neither beginners nor disabled and who were doing the type of reading appropriate to a classroom situation.

A further possible standpoint is that of reading as a socially-determined practice (e.g., Gee, 2001; Preston, 1949). When the practice of reading is addressed, the context becomes the larger range of social situations, interactions, and influences, within which reading stands as one behavior among many. Preston (1949) addressed the role of reading as affected by and effecting social change, considering not only the status of reading as one form of leisure or learning activity competing with others, but also the types of habits and dispositions supporting reading and encouraged by reading, both during schooling and on into adulthood.

Reading can also be considered as positioned in time, and can be viewed from the cross-sectional, snapshot standpoint of the environmental factors concurrently making up a particular reading situation at a particular time (e.g., Kobayashi, 2007; RRSg, 2002; Waples, 1938), and from the longitudinal, developmental standpoint of the precursors (and successors) over time of a particular reading status or capability (e.g., Alexander, 2006; Gadsden, 2000; Gray & Rogers, 1956; Stanovich, 1986; Waples, Berelson, & Bradshaw, 1940) or a particular form of reading practice (e.g., Educational Policies Commission, 1958; Venezky, 1991b). These different temporal standpoints also guide different determinations of the relevant features of the contextual setting for reading.

Construction. The construction of context as demanded by the meaning-deriving activity of the reader arises from the interpretive and collaborative nature of reading. On the one hand, although reading is set in a context, this context is not directly experienced by the reader, but is rather itself interpreted. Thus, it is necessary to take account of not only the reader's environment or situation, but also

the reader's internal representation of that environment, that is, the reader's interpretation of the context:

Strictly speaking, *contexts do not directly influence discourse or language use at all*. Rather, it is the *subjective interpretation* of the context by discourse participants that constrains discourse production, structuration, and understanding... That is, given a communicative event in some social situation, its participants actively and ongoingly construct a mental representation of only those properties of this situation that are currently *relevant* to them. (van Dijk, 1999, p. 124, emphasis in the original)

For example, Pressley and Afflerbach (1995) described the evident interpretation of context by expert readers in studies investigating verbal protocols of reading:

In addition to the specific requests and directions made by researchers, many expert readers clearly place their reading in a self-determined context. The context may be near (the social interaction of a reader giving verbal reports with a researcher present), or removed (the reader's anticipated uses of what is being read and the people who may be involved in these interactions). (p. 104)

And on the other hand, the view of reading as a collaborative interaction between author and reader raises further contextual issues, one being the reader's consideration of the text as itself having a context in terms of the author's situation and intentions when writing it. As Pressley and Afflerbach (1995) noted, "When readers engage in dialog with the imagined author... they introduce a social approach to reading, one that forces attention to the writer's purpose and social circumstances"

(p. 82). Among the clues a reader can use in deriving meaning are “his knowledge of the material read, of the time and place in which it was written ... and of the writer and his feeling, tone, and intention” (Gray, 1940, p. 24).

This construction of a context for the text can include the more or less explicit consideration of the author (T. Shanahan, 1992). However, even without overt awareness of an author, the reader, at a minimum, typically situates the text insofar as determining that it is of a particular type and written for a particular reason about a particular topic, as a precondition for beginning to make sense of it (Anderson, 2004). When the reader is hindered or wrongly oriented in thus contextually situating the text, the ability to derive meaning suffers (e.g., Christopherson, Schultz, & Waern, 1981; Pritchard, 1990).

Reading as Purposeful

Reading of connected text is essentially intentional; even at the level of perception it requires deliberate direction of attention (Hochberg & Brooks, 1976). The view of reading as a behavior carries with it the presumption that this behavior is engaged in for a contextually meaningful purpose (Russell, 1961). As Gray (1940) noted, the reader’s purpose is, in a sense, the integrative rationale allowing us to identify many different types of activities as all part of the behavior of reading:

Reading is a highly complex activity including various important aspects, such as recognizing symbols quickly and accurately, apprehending clearly and with discrimination the meanings implied by the author, reacting to and using the ideas secured through reading in harmony with the reader’s purposes, and integrating them into definite thought and action patterns. Justification for

including all these activities in a description of reading is found in the fact that they form a psychological unit which is dictated by the purpose that takes the reader to the printed page. (pp. 30-31)

Consideration of purpose and of choice to engage in a particular behavior is fundamentally a matter of motivation (Guthrie & Wigfield, 1999). The reader's motivation, that is, what moves him or her to engage in the behavior of reading, is, as remarked earlier, complex. Guthrie and Wigfield (1999) defined reading motivation as "the individual's goals and beliefs with regard to reading" (p. 199). They included among other motivational processes in their Motivational-Cognitive Model of Reading: interest in reading as an activity (intrinsic motivation); interest in a particular topic or object of knowledge (personal interest); beliefs about the nature of reading (transactional beliefs); and beliefs about oneself as a reader (self-efficacy beliefs).

The nature of the reader's purpose makes a difference in that reader's interpretation of the context (van Dijk, 1999) and of the text (e.g., Pichert & Anderson, 1977). It dictates what is being aimed at in the way of reading goals (e.g., Fox, Maggioni, Dinsmore, & Alexander, 2008), and therefore also the strategies employed while reading (e.g., Birkmire, 1985; van den Broek, Lorch, Linderholm, & Gustafson, 2001) and the standards used to determine and direct successful movement toward goals (Brown, 1980), for example, as incorporated in van den Broek's landscape model of reading comprehension: "readers set for themselves a goal or standard for coherence and engage in inferential activity to attain that standard" (van den Broek, Ridsen, Fletcher, & Thurlow, 1996, p. 181).

The derivation of meaning from text by a reader is thus determined on multiple levels by the reader's purpose. Even for reading situations that are more externally directed, such as in a classroom reading assignment, the individual reader's purpose and formulation of appropriate behavior for pursuit of that purpose are critical determinants of what goes on for that reader in the way of reading and what is derived by that reader in the way of meaning (Pearson & Tierney, 1984; Perry, 1959, 1970).

Interest. In this consideration of reading as a purposeful behavior, the emphasis is on interest taken as a predisposition, rather than as a feature of engagement in a particular reading situation (e.g., Ainley, Hidi, & Berndorff, 2002; Schiefele, 1999). Individuals can incorporate reading as a behavior regularly into their daily lives (e.g., M. Smith, 1996). They can see reading as an important source of information about subjects that interest them, as a source of enjoyment in itself, as a way to accomplish valued tasks, and as a form of self-development, as in Gray's description of the mature reader as "possessing compelling interests and motives which led to wide, penetrating reading for understanding, information, and pleasure" (1954, p. 396).

Mature readers thus come to any given reading situation driven more or less strongly by an interest in engagement in reading for its own sake, by an interest in learning for its own sake, by an interest in what they can learn from or enjoy about this particular text, and by an interest in a more or less proximate intended use of the meaning they derive from the text (e.g., Schutte & Malouff, 2007). Each of these

forms of interest represents a different aspect of purposefulness and gives rise to different formulations of goals and associated reading activities.

Epistemic orientation. The cognitive counterpart of the affective and motivational aspect of reading purpose in the form of interest is the reader's epistemic orientation; that is, the system of beliefs held by the reader regarding what reading is, how one goes about reading, what learning is, how one goes about learning, and how the two (reading and learning) are related (Alexander et al., 2011). Learners' epistemic beliefs influence what they think they know and why they think they know it, what questions they think are important to ask and how they think such questions should be investigated, as well as what a good answer looks like. Epistemic beliefs operate at the interface of the learner and what is to be learned, of the reader and the text (and its author), and can create an insurmountable barrier to the development of understanding or can make even relatively unfamiliar content approachable. They shape not only what purposes are aimed at but also how the reader goes about addressing the intended purposes of reading (e.g., Schraw & Bruning, 1996, 1999).

Among the reader's epistemic beliefs relating to purpose are whether the reader considers that the individual reader has a role in determining reading purpose (e.g., Harris, 1948; Perry, 1959), whether the reader views reading as a collaborative and interpretive interaction with an author via a text (e.g., Alexander et al., 2011; Schraw & Bruning, 1996, 1999), and what the reader views as the salient object(s) of knowledge in the reading situation (Alexander et al., 2011). Gray (1954) described the mature reader as having "an inquiring attitude" (p. 396) and as having "a central focus or point of view which pervaded or directed much of his thinking" (p. 396).

This inquiring attitude and central focus can be grounded in epistemic beliefs about reading as well as in domain-specific epistemic beliefs about a particular subject matter, each having different consequences for the way in which the reader approaches and engages in the reading situation (Alexander et al., 2011).

Reading identity. Along with epistemic beliefs about reading and learning, readers also have beliefs about themselves as readers and as learners (e.g., Schutte & Malouff, 2007). In his revised model of the role of attitude in reading, Mathewson (2004) included self-concept as a cornerstone concept (along with goals and values) underlying the influence of attitude on reading choices and behaviors. From a perspective on reading as a behavior and as developing over the lifespan, it seems natural that formulation of one's identity as a reader should be one aspect of the lifelong project of identity development (Athey, 1985; Erikson, 1959/1980). Identity as a reader includes beliefs about one's capabilities as a reader. Students learn early on in school whether they are good readers, fast readers, careful readers (Chapman & Tunmer, 2003), and such self-attributions remain highly salient into adulthood in our highly literate society, as when Neisser asserted, "I am an American...I have a liver and a spleen...I am a fast reader" (1988, p. 52), by way of giving examples of his own conceptual self-knowledge.

Identity as a reader also includes knowledge of one's own tastes and interests, and possibly also of the limits of one's knowledge, tastes, and interests; the mature reader, in Gray's description, is "keenly aware of his own dominant interests, beliefs, hopes, and biases" (1954, p. 397). Finally, identity as a reader includes a sense of how important reading is in one's life (Gray & Rogers, 1956); that is, of the place of

identity as a reader within the larger edifice that is self-knowledge (Neisser, 1988). These aspects of the individual's sense of identity as a reader play a role in the types of reading situations entered into and in the stance the reader takes within those situations (e.g., Schutte & Malouff, 2007).

Goals. A critical link between the reader's interest, epistemic beliefs, and sense of identity as a reader and what actually transpires in the way of purposeful reading behavior is the reader's formulation and pursuit of reading goals (e.g., Fox & Dinsmore, 2009; Fox, Maggioni et al., 2008). Reading goals determine why the reader comes to the reading situation in the first place, operating at the overarching level of purposes for choosing to read. Such reading goals can take many forms, as in the 62 different possible purposes for reading itemized by Gray and Rogers (1956), and address different types of outcomes, as in Pearson and Tierney's (1984) categorization of procedural, substantive, and intentional reading purposes.

Although in this perspective on reading as a purposeful behavior the reader comes to any reading situation with a purpose, some purposes bring with them less in the way of detailed constraints, as in Harris's description of the purposes in reading for recreation as "highly varied and commendably vague" (1948, p. 125). In contrast, other purposes are associated with very particular modes of reading (Gray, 1925b; Kintsch & van Dijk, 1978). Kintsch and van Dijk (1978) noted in the presentation of their construction/integration model of text comprehension that "research on comprehension must concentrate on those cases where texts are read with clear goals that are shared among readers," although they allowed that "in many cases, of course, people read loosely structured texts with no clear goals in mind" (p. 373).

Reading goals carry through also to the more specific and more flexible levels at which readers navigate through a text and monitor their progress (Pearson & Tierney, 1984). As Brown (1980) observed, "The reader's purpose determines how he or she sets about reading and how closely he or she monitors the purpose of reading, that is, understanding of the text" (p. 455). The derivation of meaning from text involves the development of understandings, interpretations, and evaluations of multiple interconnected layers of meaning, from the stratum of individual words on up to the text taken as a whole or as situated in a larger discourse context (Fox, 2009). The purposeful behavior of reading thus involves a hierarchy of possible goals and associated standards directing the form and level of reading engagement (Fox & Dinsmore, 2009; Fox, Dinsmore, & Alexander, 2010; Fox, Maggioni et al., 2008).

Reading as Transformative

As an interaction with the environment, reading is a form of both direct and indirect or vicarious experience. Readers have direct experience of the text, and indirect experience of the ideas and experiences of the author conveyed therein. As a form of experience, reading is therefore also a vehicle of adaptive learning, that is, change in response to experience. Reading both relies on prior experience and shapes how future experiences are encountered, interpreted, and internalized—not just experiences of reading, but other forms of experience as well. In their discussion of social effects of reading, Waples, Berelson and Bradshaw (1940) described this aspect of reading as transformative:

In short, reading is a social process. It relates the reader to his environment, and it conditions that relationship. To some aspects of the environment, the

reader has a primary relationship; that is, he is in direct physical contact with them. To other aspects of the environment, he holds a secondary relationship; he establishes contact only through symbols. Both sets of relationships make up his experience. Through reading the individual may extend his secondary relationships with the environment; and they may do as much to condition him, to make him what he is, as do his primary relationships...reading is one channel among many through which the environment affects the individual. (pp. 30-31)

As a vehicle of adaptive learning, reading can be thought of as both assimilative and accommodative, the mechanisms identified by Piaget for internalization of experience (e.g., 1964/1968). Given the network of patterns organizing what has been arrived at through prior experience (schemas), assimilation occurs when new experiences serve to reinforce or elaborate existing schemas, when they are organized by and incorporated into the schemas that are already present. Accommodation occurs when new experiences introduce disequilibrium, an inability of existing schemas to successfully organize what is being presented, and thereby force a readjustment and reworking of the schemas until they again can serve to assimilate. In their description of the constructively responsive nature of expert reading derived from their overview of verbal protocols of reading, Pressley and Afflerbach (1995) explicitly pointed out the evident presence of these mechanisms during reading:

It is easy to recognize the Piagetian constructive processes of assimilation and accommodation in the think-aloud protocols, with assimilation obvious when

text meaning is shaped by prior knowledge and accommodation apparent when readers' ideas about the meaning of text shift as new information in text is encountered. Some ideas in text are simply added to prior knowledge; others [sic] ideas in text require that prior knowledge be fine tuned; still, other ideas result in prior knowledge being restructured to accommodate the new-to-the reader perspective expressed in the text. (pp. 103-104)

Chall (1983) also incorporated assimilation and accommodation into her descriptions of the stages of reading development, with different stages focusing differently on internalizing experience primarily via assimilation or with more openness to accommodation.

And finally, in supporting the forms of adaptive learning that it does across the barriers of time and space, reading is powerful. It acts both at the level of the individual's need satisfaction, self-development, and self-fulfillment and also at the larger social, cultural level. In his own discussion of social effects of reading, Gray (1947) commented on the tacit acknowledgment by educators, policy makers and the general public of the potential for reading to contribute positively to individual and social development:

The wide use of reading, both in school and adult life, reflects confidence on the part of educators and the public that reading can and does contribute to personal development and influence social attitudes and behavior. (p. 269)

Experience-dependent and experience-building. In this perspective on reading as a behavior, the interpretive derivation of meaning from presented text is grounded upon prior experience at every point. In every aspect identified in this

perspective, complexity, communicativeness, anchoring in context, purposefulness, and power, reading depends upon what has been learned from prior experience.

Framing it rather extremely, Neisser asserted, "What you learn from the second half of this very sentence will depend on what you have already picked up from the first" (1976, p. 13). In considering reading as a response to the environment, it becomes evident that reading, like other perceptual, cognitive, and motivational responses, is possible only by means of organizing schemas that themselves have been tuned by prior interactions with the environment.

Not only reading but also listening, feeling, and looking are skillful activities that occur over time. All of them depend upon preexisting structures, here called *schemata*, which direct perceptual activity and are modified as it occurs. Perceiving does not require remembering in the ordinary sense, but it is an activity in which both the immediate past and the remote past are brought to bear upon the present. Genuine remembering (recall of past experience) is also such an activity, of course, as are imagining, speaking, thinking, and every other form of cognition. (Neisser, 1976, p. 14)

Knowledge is the consequence of prior experience that is typically singled out in considering how reading is dependent on prior experience, with identified important forms of prior knowledge including general world knowledge, topic knowledge, expertise-related domain knowledge, knowledge of text, and task-related knowledge (Fox, 2009). However, in this perspective on reading, other important relevant aspects that are filtered through prior experience include attitudes, interests, beliefs, goals, and values. Strang (1938) acknowledged this broader influence in her

claim that that "an individual's enjoyment of reading depends also upon the cumulative mass of his previous reading and experience (p. 37).

Along with being experience-dependent, reading, as with other such forms of response to the environment, also builds the reader's personal experience. It is the paradox of reading (and of all learning) that it is both experience-dependent and experience-building; reading both requires prior knowledge and builds the knowledge that will become the prior knowledge supporting future reading (e.g., Kintsch, 1994; Shapiro, 2004). In the same way reading also builds larger experience, well beyond just content knowledge (Gray, 1951). Learning from encounters with experience is a matter of iterative pattern-building—each encounter calls upon what has been taken away from previous encounters and shapes how the reader goes into next encounter. Pressley and Afflerbach (1995) described this in reading as a process of hypothesis construction and testing:

New information is not simply received, but rather humans construct hypotheses about the meaning of new information and test those hypotheses against the subsequent input. Humans filter new information through prior knowledge, elaborating the new ideas by relating them to what is already known. (p. 103)

Assimilative and accommodative. Internalization of the experiences afforded by reading can be considered as occurring through the Piagetian mechanisms of assimilation and accommodation, and as aiming toward the Piagetian goal of equilibrium.

One can say...that all needs tend first of all to incorporate things and people into the subject's own activity, i.e., to "assimilate" the external world into the structures that have already been constructed, and secondly to readjust these structures as a function of subtle transformation, i.e., to accommodate them to external objects. (Piaget, 1964/1968, p. 8)

The view in this perspective of reading as continuing to develop across the lifespan fits well with Piaget's characterization of mental development as tending toward a "mobile equilibrium" (Piaget, 1964/1968, p. 5), in which the achievement of maturity in intelligence and affectivity allows continual and genuine progress rather than the decline that follows upon the arrival at maturity in physical development.

In her framing of stages of reading development, Chall (1983) explicitly invoked the mechanisms of assimilation and accommodation, and noted that different stages of reading development tended to operate predominantly via one mechanism or the other. Assimilation leads to growth in the sense of accumulation of knowledge that can reinforce or elaborate on existing knowledge and experience and in the fulfillment of personal goals or satisfaction of particular needs. Assimilative reading is thus seen as important for knowledge development and maintenance (e.g., Stanovich, West, & Harrison, 1995), but tends to be more characteristic of lower stages of reading development (e.g., Chall, 1983; Marton & Säljö, 1997; Perry, 1959, 1970, 1981; Scardamalia & Bereiter, 1991).

Accommodation supports the use of reading to change existing understandings, views, attitudes, beliefs, or values, and can lead to growth in the sense of self-fulfillment or self-development. Self-development as used here means

the effort toward personal growth insofar as one seeks to increase the scope and quality of one's understandings of oneself, of others, and of the natural world. Self-development so used incorporates three of the broad areas identified by Gray and Rogers (1956, pp. 92-93) as purposes for reading: to improve or extend one's general or cultural education; to gratify intellectual curiosity or interest, and to support fulfillment of spiritual needs. Accommodative reading is thus seen as important as a vehicle for personal change, and tends to be more characteristic of higher stages of reading development (Alexander et al., 2011; Chall, 1983; Marton & Säljö, 1997; Perry, 1959, 1970, 1981; Scardamalia & Bereiter, 1991). Among the attributes of a mature reader identified by Gray and Rogers (1956) was the "tendency to fuse the new ideas acquired through reading with previous experience, thus acquiring new or clearer understandings, broadened interests, rational attitudes, improved patterns of thinking and behaving, and richer and more stable personalities" (p. 54).

Powerful. As a transformative agent, reading is powerful both at the individual level and for the culture or society as a whole. At the broader, societal level, the power of reading and writing has often been recognized, as in Ong's (1982) discussion of the differences in potential for human fulfillment between oral or preliterate and literate cultures:

Literacy...is absolutely necessary for the development not only of science but also of history, philosophy, explicative understanding of literature and of any art, and indeed for the explanation of language (including oral speech) itself.

There is hardly an oral culture or a predominantly oral culture left in the world

today that is not somehow aware of the vast complex of powers forever inaccessible without literacy. (p. 15)

Even in already literate cultures, reading can act as a social agent, moving public opinion and driving mass behavior, as in the phenomenon of Stowe's *Uncle Tom's Cabin* helping to stir up outrage against the South prior to the Civil War (Waples, Berelson, & Bradshaw, 1940).

Within the individual, reading is indirectly transformative in that it enables the pursuit of personal (and social) needs and ends in ways that would not otherwise be possible (Gray, 1951). Reading is also directly transformative from the standpoint of self-development; readers can literally shape a new self via exposure to new ideas and new ways of thinking. Reading supports growth by way of accumulation of direct and indirect experience as well as growth by way of restructuration. In his chapter on personal growth for children through reading and literature, Russell (1961) included among the aims that can be accomplished through reading: the enrichment of understandings of present and past cultures; vivid encountering of the experiences and thoughts of others; enhanced understanding of the personality and personal difficulties and accomplishments of oneself and of others; patriotism and appreciation of democracy; character development; recreation and escape; and formation of long-lasting interests in high-quality reading. As Russell (1961) argued:

The modern teacher of reading asks not only, "What is Johnny doing in reading?" but also "What is reading doing to Johnny?" The program of evaluation in reading, accordingly, is concerned not only with a child's growth

in reading interests and abilities but also with the results or effects of reading on his total personal development. (p. 555)

Gray (1937) made a similar point about reading and its effect on personal development, when he wrote that:

Reading is a form of experience which modifies personality. As pupils comprehend accurately, interpret broadly, and apply what they learn wisely, they acquire new understandings, broader interests, and deeper appreciations. Thus, personality is continually modified and enriched through reading. (p. 692)

A case study of the enrichment of personality by reading was provided by Spufford (2002), who described his own experience as a self-directed and addicted reader beginning at age 6. He connected his drive for reading and gravitation toward particular types of reading during childhood and adolescence with his general cognitive and social development in relation to Piaget's stages, as well as with the specific circumstances of his childhood. Although he was aware that reading may not represent such a key player in self-development for many children, he argued that its transformative role is nonetheless available for all readers, and that all reading (most especially self-chosen reading) is purposeful and need-fulfilling in some way. His particular emphasis was on the reading of fiction and the purposes that story reading can achieve in the way of understanding of self, of social relations, and of the world. With regard to the specific fictional form of the novel, Spufford (2002) wrote:

With its conventions that mimic the three dimensions of the world off the page, and its simulation of time passing as measured by experience's ordinary

clocks, we hope it can bring a fully uttered clarity to the living we do, which is, we know, so hard to disentangle and articulate. And when it does, when a fiction does trip a profound recognition...the reward is more than an inert item of knowledge. The book becomes part of our history of self-understanding. The stories that mean most to us join the process by which we come to be securely our own. Literacy allows access to a huge force for development. When an adult in a remote village rejoices that ABC is mastered, it isn't just because books bring the world to them; books bring them, in new ways, to themselves. (pp. 8-9)

Reading is transformative both at the micro-scale of the individual learning experience and across the lifespan. It is important to note here that reading does not necessarily accomplish these transformations, and that reading is not necessarily the only way to accomplish them, as pointed out by Waples et al. (1940).

Most of the alleged virtues of reading are more readily obtainable by many social groups from conversation, meditation, and direct experience of life; and ...unless we take full account of who reads what *and why*, the notion that reading as such has certain values for every reader is almost pure nonsense. It is legitimate to describe certain kinds of reading experience and to give reasons for approving those experiences. But it is something else to suppose that our reasons apply to readers and to reading as such, without troubling to discover what readers are denied the same experiences by their predispositions, by their limited access to publications of the specified

character, and by their inevitable exposures to other and conflicting environmental stimuli. (p. 24, emphasis in the original)

However, reading, particularly when viewed as a behavior and as developing across the lifespan, does possess undeniable transformative power and potential. McGill-Franzen (2010) acknowledged this power in her comment in relation to a recent report on research on early literacy: "Every member of the NELP [National Early Literacy Panel], as well as critics of the report, recognizes the power that literacy confers on individuals—to say transformative is to sound clichéd—but power it is, and that is why we care, why we study, and why we argue and write" (p. 275).

In the deepest sense, the transformative power of reading is not a cliché, especially with respect to reading as a behavior that is engaged in over an entire lifespan. Certainly it is important that children learn to read and their childhood reading has great value, but it holds even greater importance as the pathway to the adult reading that can accomplish the long-term self-development and self-fulfillment described above. Reading is powerful, and adult reading matters. Gray and Rogers (1956) described the "mobile equilibrium" achieved by the truly mature adult reader that enables on-going growth:

The crucial point along the route to maturity in reading is the time at which reading begins to inspire the reader, to give him a feeling of pleasure and satisfaction in the activity, and to exert a conscious integrative effect upon him. This is the point at which reading ceases to be a mere intellectual exercise of grasping and remembering meanings. It is also the point at which reading loses its quality of vicariousness and speaks directly to the reader.

Stated positively, it is the point at which reading begins to bring about serious conversions, to make changes in one's core of values, to broaden interests, to open up new horizons, and to provide new and improved ways of thinking about things. When reading begins to assume these functions in the individual's life, then he is on the way to maturity in reading. The reading-growing-reading-growing process has become self-generating. (p. 237)

Theories of Reading Development

The next move in establishing the argument for the current study is to consider theories of reading development from the perspective on reading as a complex communicative behavior developing across the lifespan, as contextually anchored, as purposeful, and as transformative. The discussion of theories of reading development will be organized around five questions derived from the proffered perspective on reading.

- What aspects of reading are taken into account?

Given the essential complexity of reading, it is important to consider which of the multiple possible aspects of reading are taken into account in describing reading development. Such aspects could include, for example: the layering of complex systems such as perception, motivation, and cognition; context and environment; purposefulness; communicativeness; and transformational character. These aspects could also be emphasized differently at different points during the trajectory of reading development.

- What are the mechanisms of growth as a reader?

Given the dynamic and interactive nature of reading and its positioning as a behavior, that is, as a meaningful response to the environment and as operating within multiple possible timescales, it is important to consider how the type of learning that is reading development is thought to occur, and which mechanisms of growth are identified. Of particular interest here is whether reading growth is considered to be a matter of accumulation of knowledge (accretion), of assimilation-supporting adjustments based primarily on feedback from experience (tuning), of accommodative reorganizations and reconceptualizations (restructuring), or some combination of these (Rumelhart & Norman, 1976; Schraw, 2006). A related issue is whether reading growth is considered to be stage-like and the degree to which it involves quantitative or qualitative changes. With regard to such aspects as interests, tastes, habits, or reading purposes, reading growth could also be described as involving movement in the direction of broadening and expansion, or more toward focusing and narrowing.

- What forms of interaction with the environment drive this growth?

In conjunction with the more theoretical consideration of the mechanisms of reading growth, it is important also to consider the practical issue of how such growth is presumed to occur as a consequence of interactions with the environment. For example, growth in reading could be seen as occurring by means of: specific instruction in reading-related competencies, such as word identification or comprehension strategy use; development of relevant forms of background knowledge about the world or about a particular subject matter; development of interest in reading or in a particular subject matter; multiple encounters with text; or a

wide and deep range of reading experiences. Different forms of interaction could be presented as more or less important at specific points in the developmental trajectory, and particular forms of interaction or combinations of types of interaction could be viewed as necessary or sufficient for reading growth.

- How does growth as a reader relate to growth as a learner and to general development?

Given that this perspective links reading development to other aspects of individual development as well as to progress as a learner, it is important to consider the degree to which development as a reader is a separable construct, and to what degree it is attributable to or associated with other aspects of human development. For example, reading development could be viewed as a relatively natural progression marching along with progress in school and with general maturation, so that third-graders read for third-grade purposes and with third-grade understanding and adults read for adult purposes and with adult understanding. Or after a certain point, reading development could be viewed as dependent primarily on growth in subject-matter expertise and tied to development as a learner in a specific subject matter or academic domain. Alternatively, reading development could be quite specific to the learner's relation to reading itself and reflect attributes that are not necessarily associated with age, grade, or status as a learner in specific content areas, such as epistemic beliefs about reading, interest in reading, and approach to reading.

- What is the ultimate aim of reading development?

Given the transformative nature of reading along with its embedding as a behavior in the context of the reader's life, it is important to consider which aspects of

reading as transformative are taken to be the ultimate aim of reading development. The behavior of reading can be seen to have an essentially instrumental role, for example, as a tool for acquiring knowledge to support other forms of academic development or as a critical skill required for navigating the tasks and duties of an adult and a citizen. It can also be viewed as itself a source of enjoyment and growth, and to be engaged in for its own sake and for its vital role in fostering self-development.

The five theories to be considered here all address reading development as beginning in infancy or childhood and continuing in some form into adulthood. The theorists concerned are: Gates (1947); Gray (1925a, 1937; Gray & Rogers, 1956); Gibson and Levin (1975); Chall (1983); and Alexander (1997, 2003a, 2003b, 2006). Their theories will be presented in roughly chronological order.

The emphasis in viewing reading as a lifespan developmental process is here placed on the projection of reading development into adult life. The emphasis could equally well be on the beginnings of reading development and how they project back into infancy, or on the entire span as somehow forming a continuum, so that what is done in reading in adulthood in some way links back to the very earliest experiences related to reading. For the purposes of framing the current study, however, the earlier stages of reading development will be given less attention, with the focus instead on the movement into and within the highest stages of reading development.

As a society, we have long tended to assume that reading development will more or less take care of itself after a certain point, with classes in *reading* (as opposed to instruction in *English* focusing on the reading of literature) seen as

appropriate only for struggling readers after early adolescence (Jacobs, 2008). Although we repeatedly find it important to acknowledge that the reading undertaken in high school and college needs instructional support (e.g., Gray, 1925a, 1937, 1951; Jacobs, 2008; Russell, 1961; Simpson & Nist, 2002; Strang, 1938), we are still exploring how best to provide this (e.g., T. Shanahan & C. Shanahan, 2008). When we assess reading performance in adolescents and young adults, we expect continued growth in the ability to comprehend and critically evaluate increasingly complex or specialized material across and within a variety of subject areas, for example as described in the newly developed Common Core State Standards for English Language Arts and Literacy in History/Social Studies, Science, and Technical Subjects (Common Core State Standards Initiative, 2010). We expect proficient adult readers to be able to "read a variety of materials with ease and interest...read for varying purposes, and...read with comprehension even when the material is neither easy to understand nor intrinsically interesting" (RRSG, 2002, p. xiii).

How does this continued reading growth happen—how do readers arrive at competent or proficient adult reading? How do they achieve full mastery of reading in the sense of becoming able to participate in the behavior of reading in ways that fully support their purposes and satisfy their needs as mature adults? A number of interesting issues arise in considering the reading growth that occurs after formal reading instruction ends, and the discussion of theories of reading development will take particular note of their treatment of these issues, as elicited by the five organizational questions outlined above. Table 1 presents a simplified overview of

Table 1
Overview of Later Reading Development (movement into and within highest stages) in Selected Theories

	<i>Highest Stages</i>	<i>Aspects of Reading</i>	<i>Mechanisms of Growth</i>	<i>Environmental Interactions</i>	<i>Growth as Individual, Learner, Reader</i>	<i>Nature of Reading / Aim of Reading Development</i>
Gates	Intermediate (4th - 6th grade) Mature (beyond 6th grade)	Cognition School context	Refinement of techniques (tuning) Attentional shift	Content-area reading demands	Normal growth as individual → Growth as reader → Growth as learner	Reading as tool / Support performance in content-area learning
Gray	Intermediate (4th - 6th grades) Entry-level mature (beyond sixth grade) Fully mature (adulthood)	Cognition Motivation Communication Purposefulness School and social context Transformative power	Refinement of skills, attitudes, habits Expansion of awareness of reading purposes Adaptive tuning / restructuring of evaluative standards Expansion / focusing of interests Accumulation of wide and deep reading experiences Restructuring of understanding of reading	Teacher-provided reading activities Instruction about reading Formative experience of literary analysis Independent reading of challenging, worthwhile texts	Growth as reader ↔ Growth as individual Growth as reader → Growth as learner Growth as learner (increased education) → Growth in reading competence	Reading as behavior / Support self-fulfillment

	<i>Highest Stages</i>	<i>Aspects of Reading</i>	<i>Mechanisms of Growth</i>	<i>Environmental Interactions</i>	<i>Growth as Individual, Learner, Reader</i>	<i>Nature of Reading / Aim of Reading Development</i>
Gibson & Levin	Transition into skilled reading Learning from reading Fully mature (adulthood)	Perception Cognition Purposefulness	Refinement supporting economy and adaptiveness Attentional shift Accumulation of prior knowledge and vocabulary	Multiple encounters with text Specific skill or strategy building instructional programs Reading varied text types, informational text	Growth as individual → Growth as reader → Growth as learner Growth as learner (accumulation of knowledge and vocabulary) → Growth as reader	Reading as higher-order perceptual skill / Support success in extracting needed or desired information
Chall	Learning from reading (grades 4-8) Multiple viewpoints (high school) Knowledge construction (college and above)	Cognition Purposefulness Motivation School context	Assimilation and tuning of reading processes and conception of reading to task demands Accumulation of knowledge Accommodation of reading processes and conception of reading to new task demands	Content-area reading demands Extensive reading Contact with experienced mentor Writing integrative essays	Normal growth as individual → Growth as reader Growth as learner ↔ Growth as reader	Reading as problem-solving / Support successful functioning in knowledge-based society or academics

	<i>Highest Stages</i>	<i>Aspects of Reading</i>	<i>Mechanisms of Growth</i>	<i>Environmental Interactions</i>	<i>Growth as Individual, Learner, Reader</i>	<i>Nature of Reading / Aim of Reading Development</i>
Alexander	Competence (entered by the end of high school) Proficiency (graduate school and above)	Cognition Motivation Purposefulness School context	Accumulation and restructuring of domain-related knowledge Automatization of domain-related strategic processing Attentional shift Narrowing and deepening of domain-related individual interest Restructuring of learning purpose toward building of new knowledge	Multiple encounters with domain-related text Domain-related instruction supporting organization and evaluation of knowledge and challenging misconceptions Domain-related instruction in relevant strategies Deliberate practice in increasingly complex or novel domain-related learning activities Provision of independent or exploratory learning experiences supporting	Normal growth as individual → Growth as learner, growth as a reader Growth as learner ↔ Growth as reader Growth as a learner → Growth as an individual	(1) Reading as learning activity in academic domains (2) Reading as academic domain / (1) Support construction of new knowledge about domain of expertise (2) Construct new knowledge about reading

growth of
domain-related
interest

Mentorship by
and participation
in community of
domain experts

the reviewed theories in terms of these five questions, focusing on their depiction of the movement into and within the highest stages of reading development.

Gates: Refinement of Techniques

Theory and its context. Gates (1947) presented his theory of reading development (first proposed in 1927) as support for his program of diagnosis and remediation of difficulties with reading. He was particularly interested in the development of diagnostic tests, and to that end needed to establish what could be considered to be normal reading processes and reading progress, in order to identify difficulties with these normal processes and deviations from the normal developmental path.

Gates (1947) organized reading development into eight periods: prereading (starting at birth); reading readiness (the early weeks of first grade); beginning reading (the early months of first grade); initial independent reading (the middle of first grade); advanced primary (the end of first grade into the beginning of second grade); transition from primary to intermediate (from mid-second grade through third grade); intermediate (fourth through sixth grade); and mature (after sixth grade). He felt that reading development overall was relatively continuous, and could be well represented quantitatively from earliest to most mature reading by either the increase in reading rate or decrease in number of eye fixations. However, he also felt that there were undoubtedly underlying stage-like transitions at work.

The word *stage* indicates stops or abrupt shifts from one level to another and may, therefore, seem to be inconsistent with the continuous course of development shown by most measures of reading comprehension. While

there is a certain artificiality in referring to stages in reading, it is nevertheless a valid and useful procedure. Although such a general factor as the speed of reading may develop continuously there may be shifts from one underlying technique or skill to another. The speed of reading may show very little change at times when quite revolutionary modifications are going on in the techniques of perceiving words. (pp. 21, 23)

Developmental mechanisms. The movement into the intermediate and mature reading stages for Gates (1947) involves mastery of general and specialized reading techniques initially emerging in a rough and imperfect form in the primary grades, for example, recognition of words by analysis and blending of syllables or processing text in thought units rather than word-by-word. Mastery of and flexibility in the use of these techniques leads to a more qualitative shift in reading development, in permitting greater thought to be given to the content, promoting better memory for what was read, greater capacity for evaluation and reflection, and the ability to anticipate potential uses of the content.

As he becomes more proficient, the pupil can give more of his attention to thinking about, evaluating, comparing, organizing, or otherwise using the content during the actual process of reading. All these abilities, however, represent increased precision, adaptability, and refinements rather than newly developed reading skills. (p. 39)

Continued growth in the mature reading period (that is, on into adulthood) amounts to becoming more facile in using the basic repertoire of reading techniques, and in applying these techniques for a greater variety of more specialized purposes

with more specialized materials. For Gates, the mechanism of growth at this point is refinement by way of efficiency and flexibility; such growth is more a matter of tuning than of restructuring (Rumelhart & Norman, 1976), with no real new techniques arising with continued development.

The average pupil is capable of making further advances in reading technique after he has completed the six grades of elementary school. Further advances consist in gradual improvement in efficiency, increased skill in word recognition, in working out the pronunciation and meaning of new words, in recognizing words during reading on the basis of increasingly superficial clues, better phrasing and organization, higher speed, and greater flexibility. (Gates, 1947, p. 38)

Environmental encounters. Reading development for Gates (1947) is essentially connected to the demands presented by the school curriculum, with the basic goal of reading being to assist in the performance of school tasks. Reading development in the early school years requires instruction and guided practice in reading, ideally instruction tuned to the individual strengths and weaknesses of each reader. However, from the fourth grade on, reading development is more a matter of adjustment to the increasing demands of the presented texts and tasks associated with learning in the various content areas, which typically require a great variety of specialized modes of comprehension, including, for example, reading for details, rereading, skimming, or reading to find specific information.

Aspects of reading, relation to wider development, ultimate aim. Gates (1947) acknowledged reading's complexity and the need to consider motivational,

perceptual, and contextual factors in reading development, but aside from the positive role of interests in early reading development, he discussed these factors primarily in terms of how they could hinder reading development rather than as constituents of reading. He viewed earliest reading development as supported by a suite of language-related, cognitive, attentional, perceptual, and motor abilities, along with knowledge of a body of relevant information and stimulation by appropriate interests. Normal early childhood development and normal progress as a learner would support coming to reading with the necessary information, interests, and abilities to promote success at learning to read; the picture for later reading development in relation to general development and development as a learner is less clear, but reading development is clearly structured around its purpose as supporting academic learning and task performance: "[reading] is a tool the mastery of which is essential to the learning of nearly every other school subject" (p. 1).

Related view. A view of reading development as a refinement of techniques that is similar in many ways to Gates's depiction (1947) was expressed more recently by Timothy and Cynthia Shanahan (2008). The Shanahans presented their view in the context of a discussion of improving adolescent literacy, turning their attention to content-area literacy in particular. They conceptualized reading as a set of skills, and represented literacy development as a narrowing developmental pyramid, with the breadth of the pyramid associated with the degree of generalizability of the skills involved (see also Venezky, 1991a, for a similar portrayal of higher-level reading skill as increasingly content-area specific and lower-level skills as more generalizable across content areas). In progressing through school, students develop an

increasingly specialized reading skill set related to the more specialized texts and tasks associated with content area reading.

For the Shanahans (2008), reading skills are most generally applicable across different texts and tasks in the early stages of reading development; these basic skills are learned by most during the primary grades. Intermediate reading, which most students achieve by the end of middle school, benefits from greater automaticity and efficiency with regard to the more basic skills and begins to become tuned to the specific nature of reading in the different content areas. The highest level in the Shanahans' pyramid, disciplinary reading skill, is developed during high school and beyond, as students are confronted with more specialized and technical text, and decontextualized and abstract language. The skills at this level are very specific to the particular texts, tasks, and language encountered.

The constraints on the generalizability of literacy skills for more advanced readers—symbolized here by the narrowing of the pyramid—are imposed by the increasingly disciplinary and technical turn in the nature of literacy tasks.
(p. 45)

The Shanahans emphasized that students rarely receive instruction in disciplinary reading, but are assumed to be able to arrive at this on their own; however, they argued that the progression to this higher form of reading does not automatically follow upon the achievement of early reading success. Here they differed from Gates (1947), who presumed that engagement in content-area reading tasks would suffice for the necessary refinement of specialized content-area reading techniques.

Difficulties with narrowness. The view of reading development presented by Gates (1947) does not consider the reader's own purposes or own understanding of the reading situation as changing over the course of reading development. The idea that reading development after 6th grade is simply refinement and increased efficiency driven by task demands suggests, for example, that a 6th-grader and an adult would respond in the same way when reading in a task presenting 6th-grade level demands. Further, Gates did not consider reading as extending outside of the school context or the possibility that reading that is done for other than content-area tasks might also have a role to play in reading development. Reading as communicative and text as authored are not part of Gates's account.

Gray: Growth Toward and Through Maturity

Theory and its context. Gray's (1925a) initial formulation of a scheme of reading development was for the purpose of designing a program of reading instruction, with an important design element being coordination with the stages of normal reading development. He began by identifying three specific phases of the reading act with different observed trajectories of growth: interpretation of content for simple or difficult passages, reading rate for silent reading, and fluency of oral reading. Relatively rapid growth in interpretation of simple passages, speed of silent reading, and fluency of oral reading had been observed during the early elementary grades, followed by slower but steady growth in later elementary and higher grades. Elsewhere, Gray (1951) further specified that growth in multiple elements of reading continues on into the high school and beyond.

Records of pupil progress show conclusively that, even in the simpler aspects of reading, such as word recognition, meaning vocabulary, and comprehension, growth continues even into college and adult life. Of even greater importance is the fact that the more mature phases of reading, such as depth of interpretation, critical reaction to what is read, and ability to read technical materials, develop most rapidly at the high-school and college levels. (p. 431)

Gray (1925a) then laid out five stages of general reading development, but noted the possibility that an individual reader could be at a different stage of development in each of the three phrases. His reading stages are: a pre-reading stage of preparation for reading (birth through early first grade); initial encounters with reading as "a thought-getting process" (p. 25; first grade); rapid development of fundamental attitudes, habits, and skills supporting interpretation, rapid silent reading, and fluent oral reading (second through third or fourth grade); extension, enrichment, and cultivation of attitudes, habits, and skills by wide reading experience, development of awareness of different reading purposes and of corresponding study habits (fourth through sixth grade); and refinement of attitudes, habits, and tastes as appropriate to the various content areas and to worthwhile out-of-school reading such as current events and works of literary or social merit (after sixth grade).

Environmental encounters. Movement through these stages is accomplished by the instructional provision of particular types of reading activities "in keeping with the learners' interests, needs, capacities, and educational attainments" (Gray, 1937, p. 690), along with engagement in appropriate independent reading. In addition, he

advocated (Gray, 1925a) that students at the highest stage of reading development should receive simplified instruction regarding what had been learned by reading researchers about the nature of reading, and should apply this understanding of the nature of reading to the study of their own reading habits.

Aspects of reading. Gray (1925a) included attitudes, habits, skills, and tastes in the aspects of reading relevant to reading development, along with awareness of different reading purposes. He highlighted the linking in reading of cognition, motivation, communicativeness, purposefulness, and transformative power, as well as the role of reading in the larger social context. In a later work, Gray (1951) explicitly incorporated cognitive, physical, developmental, attitudinal, and motivational factors, along with environment and context, as affecting growth in reading.

In the final analysis, progress in reading is determined by the interests and needs of the individual learner. Here many factors are involved: the reader's background; his capacity to learn; his physical, mental, and emotional status; his interests, motives, and drives; his immediate and oncoming developmental needs; his biases, prejudices, and preconceptions; and his home and community environment....In other words, growth in reading is influenced by the total development of a child and by all the factors that promote it. (p. 434)

Developmental mechanisms. Growth into and during the highest stages of reading development is accomplished by sharpening of skills and increased efficiency, refinement of tastes and attitudes toward those supporting socially-related and personal development, and deepening and widening of conceptualizations of reading purposes and of the nature of reading. Within higher reading development,

Gray (1940) also included the development of critical standards by which to evaluate what is read, which could involve tuning or restructuring in order to adapt to the reading purposes involved. In a later version of his scheme of reading development, Gray (1937) described in more detail what is involved in increased efficiency:

among other things, increased accuracy and independence in recognition and comprehension, greater breadth and depth of interpretation, increased efficiency in the use of what is read, wider familiarity with the sources and values of reading materials, and greater discrimination in their use. (p. 690)

He also noted the connection of increased efficiency with the specialization of purposes in the different content areas and the need for particular modes of reading to support those purposes (Gray, 1951).

Ultimate aim, relation to wider development. The goal of reading development for Gray is to support personal development in order to aid in producing "a generation of citizens with social, stable, and enriched personalities" (1937, p. 692), among whom would be those citizens with appropriate reading attitudes, habits, and skills. For Gray (1937), the highest stage of reading requires intelligent independence in choosing reading material and growing from encounters with text, with reading serving recreational, occupational, developmental, and social ends.

Whereas the broad objectives of reading have changed but little during the last decade, various social objectives have recently assumed increasing significance, such as the development of social understanding and ability to use reading in the intelligent search for truth; the promotion of a broad common culture and a growing appreciation of the finer elements in American

life; and the stimulation of recreational-reading interests that promote personal welfare and social progress. (p. 689)

Maturity in reading. Gray later joined with Rogers in a particular study of maturity in reading (Gray & Rogers, 1956) aimed at identifying the specific characteristics of fully mature reading from a theoretical and empirical standpoint. Their theoretical laying-out of the ideal fully mature reader was followed by the development of a measurement scheme, collection of interview and performance data, and presentation of case studies of adults of varying levels of maturity, followed by a reconciliation of their quantitative operationalization of the theoretical ideal reader with the qualities of the mature readers actually encountered. In this work, Gray and Rogers documented the nature of the continued growth in reading and through reading that can be attained by the mature reader who realizes the promise of the highest stage of reading development.

Their ideal fully mature reader combines: enthusiasm for reading; reading habits supporting entertainment, broadening of perspectives, creative thinking, learning about self, others, and social issues, and intensive knowledge-building in an area of special interest; successful derivation of meaning and feeling from text; use of all available relevant knowledge to support derivation of meaning; critical evaluation, both emotionally and intellectually based; building of genuinely new understandings by restructuring what had been learned from previous experience on the basis of new ideas presented in text; and appropriate flexibility in reading rate (Gray & Rogers, 1956). However, as a result of their investigations involving multiple sets of case studies of adult readers, Gray and Rogers (1956) found that not all of these

characteristics of mature reading could be conjoined in one person at the highest levels established in their operationalization. In particular, a person who reads widely across subject areas is not likely also to have the time to be able to read deeply within a particular area of intense interest.

They did find that their characteristics served for the most part to identify mature reading, and revised their set of ideal characteristics to reflect the empirical reality (Gray & Rogers, 1956). The revised portrait of a mature reader emphasizes that mature readers find reading to be an essential part of their daily lives, even though they might not spend a great deal of time reading every day. What reading mature readers do is appropriate for their purposes and they accomplish it superlatively; they are highly competent at deriving meaning and at interpreting and evaluating text. Mature readers are strongly aware of the contribution of reading to their personal growth as individuals, as learners, and as socially aware citizens, and they choose reading material that supports growth in these aspects.

Gray and Rogers (1956) also identified certain consistencies in the type of person who ends up as a mature reader, and found a set of five factors that appear to combine to support development to the point of full maturity in reading. These factors are: strong interest in learning about matters beyond one's personal experience; regular engagement in demanding communicative interactions; interest in improving self or society; some formative positive aesthetic encounter with literature and literary analysis; and an early home environment that promoted positive attitudes toward reading, learning, and other cultural activities. Interestingly, they found that

level of education appears to be most strongly related to ability to comprehend successfully, but is not necessarily linked to reading maturity.

A college education, for example, does not guarantee a mature reading pattern; neither does lack of a college education prevent one from becoming a highly mature reader. Furthermore, the amount of formal education appears to be somewhat more closely related to level of reading competence than to extent of personal reading. Stated differently, amount of education appears to be less effective in inculcating the kinds of interest and motives that lead to wide personal reading than in developing ability to understand and interpret what is read. (p. 233)

They found that, on the whole, there are very few mature readers in the adult population, and that perhaps the strongest factor contributing to the development of maturity in reading is level of intelligence, although they did not formally measure intelligence in their study. However, intelligence has to go hand in hand with the stimulus of interest both in reading and in the contribution of reading to personal development: “highly mature readers possess the motives or inner drives and the reading skills that enable them to make use of reading in harmony with their enthusiasm for the role it may play in their lives” (p. 232).

Related view. Russell (1949, 1961) presented a systematic overview of reading development essentially similar to that of Gray (1925a), although he included an additional stage in early reading development (at second grade), for a total of six stages rather than the five outlined by Gray. Along with Gray, Russell also considered reading development to involve attitudes, reading purposes, and reading

habits as well as skills, and he explicitly defined reading as a communicative behavior (1961).

Russell's discussion of reading development is noteworthy for his strong emphasis on individual differences and individual rates of development; although he identified stages, he also stressed both the gradual, continuous nature of reading growth and the very different abilities, interests, and situations of individual readers that could factor into reading development differently at different points of development. Russell (1949) also discussed with great insight the role of the environment, including school, home, and neighborhood as aspects of the child's environment as a developing reader. He considered how reading could satisfy physical, instrumental, and personal-social needs (1949); he saw the aim of reading growth to be the support of personal development and informed citizenship, and advocated development of maturity in reading attitudes, habits, and skills as contributing to improved quality of life (1961).

The modern point of view arising out of the child study movement sees reading not as a set of skills but as a part of the well-rounded development of children and adults. It is a means to greater knowledge of a topic, more understanding of one's own and others' behavior, and better adjustment to social situations. (1949, p. 11)

Areas for further specification. Although Gray's theory of reading development as expressed in his various writings (1925a, 1925b, 1937, 1940, 1951) and as expanded by his consideration with Rogers (1956) of maturity in reading is quite satisfyingly inclusive, there obviously remain areas that would benefit from

greater articulation and further specification. In particular, it is not quite clear how a mature reader could read either widely or deeply; those activities seem likely to promote (and rely upon) the development of different types of bodies of knowledge, to be differently motivated by interest, to be supported by different conceptions of the purpose of reading, and to require different types of reading capability. The possible ways in which the reader's knowledge, interest, and understanding of reading come together in the reading act and what the reader takes away from that act would appear to be a fruitful area for further investigation within this framework. The path reading development takes between sixth grade and the more full reading maturity investigated by Gray and Rogers, the role of formal education in such development, and the precise relation of reading competence and reading maturity also invite a closer look.

Gibson and Levin: Adaptiveness and Economy

Theory and its context. Gibson and Levin (1975) presented their description of reading development in the context of a discussion of the psychology of reading from the particular standpoint of perceptual learning. In their view, perceptual learning encompasses learning about the features that distinguish things as different, learning about the invariants over time in a single event and across time for a particular type of events, and on the basis of those two forms of learning, abstracting to identify superordinate and subordinate relations, which they termed higher-order structures. They considered that perceptual learning is the foundation and archetype for the learning involved in learning to read.

Meaning (the aspect of it which we refer to as adaptive significance) is rooted in the perceptual learning provided by these experiences....There is a long road from perception of the meaning of an ongoing event to perception of meaning in words printed on a page that one is reading, but the beginning is here. (p. 20)

They treated reading as a "higher-order perceptual skill" (p. 11), while also acknowledging that reading is "a highly complex cognitive process involving much more than perceptual skill" (p. 11). Reading development is viewed as a process of acquiring the skill of reading, with reading being defined as "extracting information from text" (p. 5).

Gibson and Levin treated reading development as having four distinct parts but as progressing in a relatively continuous fashion: prereading, which is prior to the beginning of formal reading instruction and during which much of the language development necessary for reading occurs; beginning reading, which primarily involves learning to decode words, although they also noted the need for instructional attention to comprehension and reading for meaning as motivational and as related to reading's eventual use in extracting information; transition to skilled reading, when decoding, subvocalizations, eye movements, and other mechanics of reading are becoming efficient and integrated; and learning from reading. Learning from reading depends not only on skill at the mechanics of reading, but also on: selective attention to and extraction of relevant information; assimilation of the extracted information to existing knowledge structures; retention of this assimilated information in memory; making inferences to support comprehension, elaboration, or application of text

meanings; and appropriate application of the knowledge gained from reading to fulfill immediate or more distant purposes.

They considered reading development to continue during adulthood, but described this extended development as based on accumulation of knowledge of the world and of vocabulary rather than as skill acquisition: "Learning to read goes on for many years, perhaps all one's life, as one's vocabulary and knowledge of the world continue to increase" (Gibson & Levin, 1975, p. 335). They also separately discussed mature skilled reading as a somewhat disconnected endpoint of development, considering both the extant theoretical models of the adult reading process and their own set of five case studies of adult self-reports on reading self-chosen texts for a variety of purposes, and arrived at the two core perceptual learning principles of economy and adaptiveness as characterizing mature skilled reading.

Developmental mechanisms. For Gibson and Levin (1975), the mechanism involved in high-level growth as a reader is essentially tuning, along with the accumulation of vocabulary and knowledge noted above. The movement into skilled reading requires refinement of reading processes at the level of mechanics of reading, which would then permit an attentional shift and increased self-awareness enabling the integration of these processes, the employment of cognitive strategies, and the adaptation of meaning-related processing activities to the specific reading purpose at hand.

These mechanical processes must become smooth and automatic before attention can be strongly concentrated on the meaning to be extracted, for, as

we have seen, the beginning reader in particular finds it hard to attend to all these activities at once. (p. 378)

Their principal explanation for what is involved in this refinement was increasing economy of processing and reduction of information. Processing becomes more efficient and therefore more economical by means of selective attention to relevant information, processing of the largest units possible, and processing of the least amount of information possible. For example, a skilled reader can focus on particular forms of information, such as semantic information, can attend where possible or valuable to units of varying sizes, such as letters, words, clauses, or larger idea units, and can process different amounts of information as appropriate, as when skimming a text for a particular detail. The reduction of information supporting this efficiency is accomplished by elimination of possible alternatives via use of induced rules and text-based constraints and use of old information to comprehend the new. The movement from the initial level of skilled reading to successful learning from text and on into full maturity is for Gibson and Levin (1975) a matter of this increasing economy along with adaptive flexibility in matching reading processes and reading purposes, as well as improvement in the specific components of learning from text noted above.

Aspects of reading, ultimate aim. Although Gibson and Levin (1975) approached reading as a higher-order perceptual skill, they acknowledged the essential involvement of cognition in reading, particularly stressing the need at the higher levels of reading development for adaptive, flexible, and economical use of cognitive strategies. They discussed the importance of language development for

early reading, and the necessity for children to understand that reading is participation in a written version of oral communication, but these aspects of reading were not emphasized in regard to higher reading development. They also recognized an important role for motivation. However, motivation for them is subsumed under purposefulness; the underlying motivation for reading is the desire to find things out, which they viewed as intrinsic and innate in human beings. Although they mentioned curiosity and interest as motivational levers in early reading of stories, their definition of reading as extracting information privileges information-getting as the most valuable motivational trigger.

There is a natural reward for reading. One finds out something. Getting wanted information from the marks on the page is an obvious motivation for learning to read, and every effort should be made to encourage it and take advantage of it. (pp. 35-36)

Gibson and Levin took it as a given that adult readers have multiple varied purposes for reading, because there are many and various types of desired or needed information to be extracted from text. Purposefulness therefore drives the need for adaptive flexibility in accommodating the reading processes used to the purposes and text at hand.

Environmental encounters. Movement into skilled reading and toward learning from text is accomplished for Gibson and Levin (1975) by dint of repeated encounters with texts to promote smoothness and economy in processing. In addition, they reviewed a number of instructional training programs intended to support the development of reading-related skills and success in learning from text.

They further recommended that students be exposed to a variety of types of textual material, particularly informational texts, so as to gain experience with the activity of extracting information according to the text type and to appropriate purposes pertaining to the text type. The types of encounters supporting development as a mature skilled reader were not explicitly discussed, but presumably include wide reading, so as to become facile at using text.

How does success in reading for different kinds of information develop? A child still mastering the mechanics of reading can hardly be expected to show this flexibility. Perhaps it can be taught at a later stage, as the school and recreational facilities broaden the reading matter to include everything from dictionaries to craft instructions to science to poetry and so on. It seems to us that exposure to such a broad diet is the basic vehicle for learning adaptive reading strategies, but explicit instruction may help. (1975, p. 472)

Relation to wider development. In Gibson and Levin's (1975) portrayal of reading development, higher-level reading development and development as a learner have a reciprocal relation. Becoming a more skilled reader supports learning from text. This growth as a learner supports the accumulation of knowledge and expansion of vocabulary, which would in turn contribute to further growth as a reader. However, the relation between reading development and growth as an individual was depicted as unidirectional. Reading development moves along with other aspects of individual development, aided by exposure to text, and becoming a mature reader means reading like an adult. Gibson and Levin commented that,

It is enlightening, indeed, to compare the flow of psychological processes in reading with their flow in living. Reading, when the stages of acquisition are sufficiently finished, is a kind of living. (p. 475)

Adults have more varied purposes for reading, and read adaptively to accomplish those purposes; however, although fulfillment of adult purposes through reading might support individual growth and self-development, there is no suggestion that it does so in any regular way.

Disconnection problems. Gibson and Levin (1975) explicitly acknowledged that they did not arrive at any adequate modeling of what a mature reader does when reading, nor did they think this would be possible for anyone else to accomplish. Their description of how reading development progresses does not actually serve to connect the developmental path from skilled reading to learning from reading and then to mature reading; such connection as there is comes by way of reading purposes, in a *deus ex machina* role. They also had some difficulty in getting from perceptual aspects of reading to text as having additional forms of information available to extract in the way of meanings, and those meanings as somehow coming together in reading comprehension. Although they attempted to bridge this over with their extension of the perceptually-based principles of adaptiveness and economy to cognitive activities as well, again, the connection is rather by fiat than as comprehensively established in their account. Further, the idea of reading as connection between human beings (author and reader) is difficult to situate within their account; although the mature readers in their case studies appear to be operating

under an understanding of reading as communicative, how this would arise from a perceptually-grounded developmental framework is hard to fathom.

Chall: Accommodation to New Problem-Solving Tasks

Theory and its context. Chall's discussion of reading development is the central focus of her 1983 book presenting and justifying her stage model of reading development from birth into adulthood. On her view, a full understanding of the nature of the different stages of reading development and the transitions between them would enable both efficient and effective detection and remediation of reading difficulties and also the design of instruction to support the specific needs of learners at each stage. She argued that conceptualizing reading development as stage-like requires the existence of a more or less universal series of stages to be progressed through in a more or less invariant order, as well as a typical rate of progression. Her strong version of a stage model, with important differences in the nature of the reading process at each stage, means that transitions between stages or resolutions of the issues presented by stages are of particular interest.

Chall (1983) hypothesized that "stages of reading development resemble stages of cognitive and language development" (p. 11) and that "reading is at all stages a form of problem-solving in which readers adapt to their environment (as per Piaget) through the processes of assimilation and accommodation" (p. 11). In this way, she built upon Piaget's work on the stage-like nature of cognitive development and adopted the Piagetian cycle of assimilation and accommodation in explaining the developmental activity within and progression along the different stages. In addition, she made use of Perry's (1970) work on higher intellectual development to account

for the types of change in views of knowledge involved in movement within and during her highest stages of reading.

Reading development has six stages in Chall's (1983) formulation: prereading (Stage 0, from birth to grade 1), during which linguistic and literacy-related early development occurs; early reading, focusing on decoding and achievement of the linking of phonemes and graphemes (Stage 1, grades 1 and 2); attainment of fluency, increased sight word recognition, and confidence in use of context (Stage 2, grades 2 and 3); learning from text, (Stage 3, grades 4 through 8); learning to deal with multiple viewpoints (Stage 4, high school); and reading to construct one's own knowledge (Stage 5, college and beyond). The nature of the reading process is different at each stage, as is the reader's conceptualization of reading.

In Chall's (1983) model, a general tendency across the stages is increasing efficiency, as assessed by physical indicators such as eye movements and reading rate; each successive stage also requires more time spent on reading. In addition, the complexity, obscurity, technicality, and abstractness of the language readers are able to grapple with grows across the stages, while their approach to text aims at increasingly higher levels of inferential, critical, and constructive response, and comes to incorporate predominantly top-down processing. As they move through the stages and encounter more specialized and difficult texts and higher-order tasks, readers require the support of increasing knowledge of the world and about the topics they encounter. Because of this, an individual reader could be at different stages in relation to different content areas or types of reading material. Each stage

incorporates the capabilities mastered in the previous stage, and earlier modes of reading remain available as the situation demands.

Typical literacy behavior does not stay at one stage only. Those who read at Stage 5 for study and work may relax with a mystery at Stage 2. Although the general character of reading changes with each succeeding stage, the abilities of previous stages remain for use in situations that require them. (p. 26)

In Stage 3, readers use their newly developed fluency and confidence to turn their attention to reading for meaning and accumulation of new knowledge in the form of factual information, in response to the increasingly demanding content-area reading tasks confronting them in school: “accommodation to Stage 3 is achieved through the learning of subject matter—science, social studies, and literature” (Chall, 1983, p. 49). They read to comprehend and for recall, and begin to develop efficient study habits; their reading tends to be close, careful and accurate. For Chall, Stage 3 is viewed as a basic level of reading capability, such as would have served when many people got no more than a grade-school education.

Stage 3 may be viewed as the average minimal level needed for the great majority of people in an industrial society—a level at which one can acquire new information and vicarious experiences from newspapers and magazines, and from books that are written on not too complex a level. (p. 49)

As students move into high school, instructional expectations come to include the need to distinguish and understand multiple viewpoints, the key characteristic of Stage 4 reading in Chall's (1983) model.

Accommodation to Stage 4 takes place when the reading tasks, particularly those at school, cover a multiplicity of knowledge—facts, ideas, opinions, views—with discussions and written assignments designed to force the student to grapple with that multiplicity. Most content areas in the secondary schools lend themselves well to providing the needed challenge and practice. (p. 51)

High-school students read to analyze and evaluate, and consolidate their efficient study habits; their reading tends to be wide-ranging, pattern-seeking, and provisional—they do not yet have a standpoint permitting reconciliation or integration of the multiple viewpoints that emerge. Interestingly, Chall (1983) identified Stage 4 as an appropriate level of reading capability for the workplace demands of modern society, and also as the likely endpoint for the reading development of many, if not most, readers.

Stage 4 may be viewed as the minimal reading competence required in a knowledge society, one in which communication of information is the most valued pursuit. It assumes the ability to read efficiently complex materials on a wide variety of topics, from a variety of viewpoints. (p. 49)

With the move to college and perhaps on into graduate school, instructional demands shift yet again in Stage 5, with the expectation that students will construct their own viewpoints and justify them to others (often in written form); this requires personal integration of the multiple separate patterns detected. For Chall (1983), reading at this stage is increasingly analytical and evaluative, as well as creative and even courageous; it tends to be extremely competent, focused, and flexible. This

stage is not attained by all college or graduate students, as it requires distinct personal characteristics as well as a particular configuration of environmental supports and constraints.

Some of the conditions of a successful transition to Stage 5 are: broad knowledge of the content that one will be reading at Stage 5; high efficiency in reading, personal courage, daring, confidence, and humility; and an environment that encourages Stage 5 reading—the college or professional school that expects and teaches for it, and a community that rewards it. (p. 52)

Chall's Stage 5 reading is thus the type of reading done when reading in one's area of academic specialization, and rests upon a large body of accumulated knowledge and familiarity with specific types of text. The idea of expert reading (and writing) as a form of domain-specific academic expertise was considered in greater depth by Geisler (1994), who used expert-novice comparisons to unpack more completely what was involved in the arrival at such academic literary expertise and participation in the academic discourse community.

Developmental mechanisms. Progress in reading development for Chall (1983) occurs through a successive process of assimilation and tuning, accumulation of knowledge, and restructuring in accommodation to new environmental demands.

Essentially, reading tasks may be viewed as problems to be solved. The solution may lie in assimilation, that is, in adapting to the new task in a manner used previously to adapt to the old. That is, new reading tasks may be treated as essentially similar to the older, known tasks, with similar solutions.

In the second kind of problem solving, accommodation, the reader uses new forms of thinking to solve new problems, by changing, by restructuring his or her knowledge and abilities. (p. 40)

As a reader enters a new stage, assimilation provides repeated practice with the new task demands and new approach called for by the new problems associated with this stage. The repeated practice enables tuning and increased efficiency at this type of reading. Such assimilative reading also enables the accumulation of the type of knowledge sought in the reading at each stage, for example, facts and details in Stage 3. The development of a supportive body of knowledge also promotes efficiency, as what is encountered becomes more and more familiar or readily assimilable. In this way, the reader, by mastering the demands of a given stage, becomes prepared for the shift involved in tackling the higher-level demands presented by the higher-level type of reading required in the next stage.

Environmental encounters. A particular conclusion Chall (1983) drew from this way of understanding reading development is that reading instruction, particularly in the early stages of reading, should be guided by the view of reading appropriate to each stage. In early reading, children should be thinking about learning to decode, and instruction should present that as their central task, while in later reading they can begin to think about reading to learn. Similarly, later reading development is best fostered by instruction aligned with the learning tasks and views of learning held at those stages; elementary students would not be ready to hear about the idea of multiple viewpoints, for example. In her view, a developmental approach to reading and to reading instruction means meeting the students at their particular

level, even as this entails the necessity to re-characterize the nature of reading and of learning repeatedly for students each time they move to a new level.

As is evident in the description of her model, for Chall (1983) the principal form of environmental interaction driving movement into and during the higher levels of reading development is content-area academic task demands and expectations. Formal reading instruction is not necessary for this progression, although it could provide additional support for those who need it.

Once readers learn to do Stage 3 reading, it is possible for those with high ability, motivation, and much practice to advance to Stages 4 and 5, perhaps, with little additional formal reading instruction. (p. 70)

Readers restructure their conception of reading because they are given reading tasks requiring a different approach to reading; in the course of assimilation they will internalize this new understanding of reading, eventually engaging in this version of reading with consistent success and control. For the move to Stage 5, Chall also included contact with a supportive teacher or mentor who models Stage 5 reading while shaping the reader's understanding of what this entails. The transition to Stage 5 requires as well the need to present and justify one's viewpoint, typically in writing. Wide, deep, and focused reading are also forms of environmental encounter supporting higher-level reading development in Chall's model.

Aspects of reading. Chall's (1983) description of higher-level reading development and of reading as increasingly higher-order problem-solving is dominated by the cognitive aspect of reading. In addition, purposefulness is a central aspect of reading development addressed by Chall's view, in that changes in the

reader's purpose associated with the need to accomplish different types of academic reading tasks characterize the different stages of reading development. Along with this change in purpose goes a change in epistemic beliefs; the reader's view of the nature of reading and of what good reading means come to differ significantly from stage to stage. She gave a nod to the aspect of motivation, noting that motivation is implicitly necessary in the level of reading engagement required for reading growth to occur.

At all stages of development, reading depends upon full engagement with the text—its content, ideas, and values. Thus, motivation, energy, daring, and courage are aspects to be considered in the full development of reading. (p. 12)

The habit of extensive reading, presumably supported by strong interest in reading, is also important, and she mentioned the need to instill the love of reading early on; attitudes toward reading pervading the home, school, and culture are also noted as a factor in early reading development. Chall hinted as well at a role for self-concept as a reader, in noting the necessity for confidence and bravery as a reader in taking the accommodative leap of transitioning to a new stage.

Relation to wider development. Development as a reader and development as a learner are clearly co-determinant in Chall's (1983) model of reading development.

Thus, education and reading are circular—the more a person has of one, the better the development of the other. The more the knowledge, the better the reading, the better the skill and uses of reading, the better the knowledge.

(p. 8)

The view of reading and of the purpose of reading at any given stage reflects the learner's view of how knowledge is to be built at that stage, based on the learner's relation to the subject-matter or the object of knowledge. For example, when learning (as presented in subject-matter instruction) is viewed as accumulation of facts, the Stage 3 reader pursues facts and details. The successful pursuit of facts and details in reading about a particular subject-matter and the building of a single well-developed viewpoint could then set the stage for the shift to a view of knowledge about that subject-matter as to be gained by consideration of multiple perspectives and larger patterns, which would then translate into a different mode of reading in Stage 4.

In Chall's (1983) discussion of the relation of reading development to other forms of individual development, it appears that normal growth as a reader is supported by normal development in cognition and language not only for early reading but also for attaining the highest levels of reading development. She suggested as well that this relation is reciprocal, and that cognitive and linguistic development (particularly early cognitive and linguistic development) are supported by reading development, but did not explicitly spell how this would occur.

There is general agreement that the limits of literacy are set by cognition and language. Yet some evidence also shows that training in and growth of literacy affects linguistic and cognitive development. (p. 176)

She did not address the relation of reading development to aspects of individual development other than cognition and language.

Ultimate aim. Chall viewed reading development as having long-range consequences or desired endpoints primarily in terms of successful adult functioning in the economy. She connected reading to possible adult job-related needs and uses of reading in her descriptions of Stage 3 reading as minimally functional, Stage 4 as fully functional, and Stage 5 as appropriate for high-level academic work and the creation of new knowledge. Her only other discussion of the role of reading outside of school or for adult purposes came in the context of a discussion of minimum acceptable reading proficiency levels for adults.

Two other criteria are important for judging essential reading needs of adults: civic needs, such as the ability to read income tax forms and instructions, applications for health services, and so forth, as well as to read about world, state, and local events from newspapers and magazines; and personal needs, such as writing letters, reading to one's children, and reading what most others read. (p. 162)

She acknowledged that the achievement of high-level reading had personal and social value of some unspecified nature:

To reach the most mature stages of reading is of value to both the individual and to society. No evidence suggests that too many highly literate and highly educated people are a burden to society. (p. 84)

However, she posited that Stage 4 and Stage 5 stand side-by-side as successful alternative ends to reading development, in that both position the adult reader as a viable participant in a knowledge-based economy. Her stage 4 and stage 5 reader both have moved beyond literal reading focused on the facts, and have adopted what

has elsewhere been characterized as a deep approach (Marton & Säljö, 1997), progressing past the dualism of right and wrong answers and the reliance on unquestioned authority as the source of certain knowledge (Perry, 1970, 1981) or the "obedient purposelessness" and inflexibility of word-by-word reading (Perry, 1959, p. 197). Stage 5 readers, however, have the particular advantage of not only being able to question and evaluate different viewpoints, but also being able to reach a provisional but nonetheless satisfying personal resolution of them.

Endpoint and other problems. It is interesting that Chall (1983) saw Stage 4 as a fitting endpoint when for Perry (1970, 1981), the comparable positions of multiplicity and relativism are way-stations on the path to more complete intellectual and ethical development, points at which the learner is preparing for finding but not yet able to find what he or she truly believes—as constructed by himself or herself. This standpoint was described as confronting the learner with the possibility of "humanly unbearable disorientation" (Perry, 1970, p. 134), which could be resolved by becoming passive and disavowing any responsibility, by becoming a self-acknowledged opportunist, or by moving on to the further developmental level of commitment. Chall chose not to incorporate these aspects of Perry's view of this stage of intellectual development into her portrayal of Stage 4 reading, but the legitimacy of her partial adoption of Perry is worthy of question, as is her positioning of Stage 4 reading as a desirable developmental goal.

An additional questionable aspect of Chall's account is the degree to which it is reasonable to expect that a reader who has fully attained a more mature understanding of the purpose of reading in relation to a particular subject-matter

would then lose that understanding when reading in a different subject area. It might be the case that an adult reader could choose to read in a certain way to fulfill a certain purpose, or find themselves constrained to read in a certain way by the demands of the text and the task. However, it might be expected that they would nonetheless be aware that there are other ways to read; they might even prefer to read in those ways, or see those ways as more satisfying or as desirable to strive after. So the adult reader who can read at Stage 4 or Stage 5 levels but reads at Stage 3 in encountering an unfamiliar subject-matter would have a fundamentally different stance than a child reading at Stage 3, and would be aware of the difference between this particular form of reading and what he or she can typically do. The radicalness of a change in the understanding of the purpose of (all) reading does not appear to be fully acknowledged by Chall.

Alexander: Progression Toward Domain Expertise

Theory and its context. The theory of reading development proffered by Alexander (2003b, 2006) is a specific application of her broader Model of Domain Learning (MDL; 1997, 2003a) to the academic domain of reading, where an academic domain fulfills the following conditions:

Domains are recognized fields of study often associated with formal education or training...Domains are also aligned with a community of practice, signified by its particularized lexicon, established routines, and accepted rituals.

Moreover, there is a body of specialized knowledge associated with the domain that is acquired over an extended period of time and with extensive

effort. Finally, academic domains...are marked by typical problems and by related problem-solving approaches. (Alexander, 2003b, pp. 51-52)

Alexander's aim in presenting the progress toward expertise in academic domains as multidimensional and stage-like was to acknowledge the conjoined and domain-specific action of motivational, cognitive, and strategic forces along a continuum of academic development. In this way she hoped to expand upon the understanding of what was behind student success or failure at given points in development, thus supporting possible instructional interventions aimed at appropriate aspects of knowledge, interest, or strategy use for students at different developmental stages in a given domain (1997, 2003a). She presented the understanding of academic development and the movement toward expertise as requiring consideration of more than just cognition and investigation of more than just the differences between experts and novices (2003a).

In positioning reading as an academic domain within this developmental framework, Alexander wished to stress that "reading is more than a discrete set of skills and more than an aesthetic response to literature" (2003b, p. 52), and that reading development continues across the lifespan (2003b, 2006). Adoption of this broad and complex perspective on reading was projected as possibly serving to unify the multiple and various views of reading splintering the field (Alexander, 2003b; Alexander & Fox, 2004; Fox & Alexander, 2009; Fox & Alexander, 2011).

In the general MDL (Alexander, 1997, 2003a), learners progress from acclimation to the domain into competence, which can then be followed by the transition into proficiency or domain expertise. The trajectory through these stages is

likely to be associated with length of experience in learning about the domain, so that the stage of acclimation is typically seen in learners in the early grades of schooling, while domain competence in the major school subjects is seen as a desirable goal for learners to strive to achieve by the end of their K-12 experience. The movement into proficiency is typically initiated in undergraduate or graduate school, although the potential for wide individual differences in when particular stages are reached in particular domains is acknowledged.

The shifts described by the MDL are not strictly aligned with chronological age, as much as they are with the experiences and schooling that are often age-associated. Therefore, it is possible to be an expert in some domain at age nine or an acclimated learner in another domain at age 90. (Alexander, 1997, p. 219)

The MDL maps academic development in terms of changes in the levels of three interactive dimensions, each having two characteristic forms: knowledge (domain and topic); strategic processing (deep and surface); and interest (individual and situational).

Situational interest in the MDL (Alexander, 1997, 2003a) is a transient arousal or heightened attention sparked by features of the proximal environment. Individual interest in the MDL refers to an abiding and deep-seated personal involvement with a given topic or domain, which can be manifested as a more general interest associated with choice of everyday activities or as related to choice of vocational or professional activities (2003a). An individual interest in a subject-matter, by definition, implies the desire to learn more about it.

In describing the nature of individual interest, its relationship with goals is almost self-evident. Even terms (e.g., pursuit), used to mark an individual's abiding interest suggest that the learner has an intention or goal to understand or learn more about the domain. (Alexander, 1997, p. 222)

The MDL (Alexander, 1997, 2003a) portrays knowledge as dual in nature, involving both the learner's breadth of knowledge across the entire domain and also depth of knowledge of specific topics within the domain. Strategy use in the MDL is bifurcated as well, into surface-level and deep-level strategic processing. Strategy in the MDL refers to general cognitive, metacognitive, or self-regulatory strategies, with domain-specific strategies being positioned within domain knowledge (Alexander, 1997). Strategies are deliberate and effortful procedures, but with practice can become automated and skillful, rather than strategic, in nature (Alexander, 1998). Surface-level strategies aim at access to and initial comprehension of text or identification and resolution of superficial aspects of the problem situation. Deep-processing strategies move beyond, to the internalization or transformation of meaning in activities such as interpretation, comparison, or evaluation.

In the MDL (Alexander, 1997), learners in the stage of acclimation do not yet have much breadth or depth of knowledge in the domain, and what knowledge they do have is typically fragmented; their interest in the domain is correspondingly low. When they engage in the activity of learning in the domain, such as when reading domain-related material, their strategic processing tends to be superficial, aiming more at local coherence of the text rather than integration of the text with their own understanding.

Over time and with practice in the domain, learners can move on to the stage of competence, on the strength of any of the following: greater organization of knowledge, stronger individual interest, or a shift to deeper-level processing (Alexander, 1997). In competence, learners amass a respectable body of organized knowledge in the domain, develop a more enduring interest in the domain, and become willing and able to bring to bear processing strategies that more fully integrate the meaning of the text with their own knowledge. Competence in an academic domain represents the endpoint of development for most learners, who will not continue on to become domain experts, those who create new knowledge in the academic domain. However, for those learners who conjoin the requisite levels of interest, knowledge, and strategic processing in their pursuit of further domain learning (Alexander, 1997), the progression to proficiency in the domain occurs.

A synergy of forces is required for the transition from competence into expertise—highly rich and principled knowledge, effective and efficient use of strategies, particularly deep-processing strategies, and a personal identification and investment in the domain. (Alexander, 2003b, p. 57)

Proficient learners in an academic domain are generally those who have made it their profession. Their identity is bound up with the study of the domain and the pursuit of new knowledge-generating questions, and their interest is clearly enduring and internal. Their body of principled knowledge has grown and will continue to grow, and their strategic processing is deep, efficient, and engaged.

MDL and reading. In the MDL, reading and learning from text are inextricably intertwined with academic learning and progress toward academic

expertise (Alexander, 1998; Alexander & Jetton, 2000). This intertwining was also identified by Scardamalia and Bereiter (1991) in their discussion of literate expertise: "...reading expertise, though intimately connected with expert knowledge, is sufficiently distinct to interact with it in an important way" (p. 175). According to the MDL, those who do become expert learners in an academic domain will tend to read expertly in that domain, supported by their strong individual interest in the domain, their awareness of and engagement in deep-level processing when reading domain-related text, and their extensive and principled body of knowledge related to the domain and its relevant topics (Alexander, 1998). The path to expertise in any academic domain thus involves becoming progressively more expert in reading as used in the personal development and shared construction of knowledge in that domain.

The specific developmental progression in reading as a domain (Alexander, 2003b, 2006) follows the path mapped out in the general MDL for other forms of academic domain development, with each of the relevant dimensions and stages characterized in terms of its instantiation with regard to reading as the subject-matter and domain at issue. When reading is taken as the academic domain within which development as a learner occurs according to the MDL (Alexander, 2003b, 2006), arrival at proficiency therefore means becoming an expert in the specific subject-matter of reading, along with partaking of the progression in domain-specific reading development associated with achievement of domain-specific academic expertise. The individual who arrives at proficiency in reading as an academic domain will thus be an expert in reading as a subject-matter, and will therefore also be expert at

reading about reading, as investigated, for example, in the reading by experienced reading researchers of a text on reading processes (Fox, Maggioni, & Riconscente, 2005; Fox, Maggioni et al., 2008).

Developmental mechanisms. With regard to how individuals progress through the stages of the MDL, Alexander noted that, "the manner in which these transformations unfold remains mysterious. The boundaries between stages, unlike the demarcations on maps, are shadowy or nebulous instead of sharp and definitive" (1997, p. 219). However, although the boundaries might be indistinct, she outlined quite specifically the mechanisms of progression into and during the higher stages of development in the MDL. They include accumulation and restructuring of domain and topic knowledge, with domain and topic knowledge becoming more thoroughly interwoven as the organizing principles of the domain come to fully inform the learner's conceptual understanding of it (Alexander, 1997). Familiarization with the typical texts and typical problems encountered in the domain means that execution of strategies can become more automatic and skillful; this frees up cognitive resources for the pursuit of questions beyond the literal meaning of the text or investigation of more complex and novel problem situations. Narrowing and deepening of domain-related individual interest also support this shift of attention to investigation of more probing questions, with the intention of building personal knowledge and pushing forward the frontier of shared knowledge. For reading development, this individual interest takes the shape of "a passion for the process of reading, or for encounters with specific forms of text" (Alexander, 2006, p. 421), which forms "an abiding connection between themselves and written language" (Alexander, 2006, p. 421).

Environmental encounters. The type of environmental encounters supporting reading development into and during competence and proficiency in the MDL (Alexander, 1997, 2003a) include practice and familiarization with typical tasks and texts of the domain, both those likely to be often encountered and also those invoking more complex or abstruse domain situations. The learner needs instructional guidance in strategies and in the organizing domain principles by which to determine which content is central and which peripheral, and by which to judge accuracy of new information. Instruction aiming at identification and correction of domain-related misconceptions is also necessary. However, the learner also needs to begin to develop autonomy in learning and in sustaining his or her own motivation to invest the effort to pursue self-generated questions. The competent learner needs both guidance and independent experience in projecting himself or herself into the possibility of being an expert in the domain. For the expert, participation in the domain-specific community of discourse is important to support the activity of construction of new knowledge, while for the competent learner, the assistance of an expert mentor is an important component of growth toward proficiency.

The availability of knowledgeable mentors is...significant for the realization of proficiency or expertise. It may well be that one single person does not possess all the knowledge, strategies, or motivational characteristics that a proficient learner requires in a mentor. This is one reason that proficient learners may work within a community of experts who can serve, in effect, as a composite mentor for its members. (Alexander, 1997, pp. 237-238)

Aspects of reading. The view of reading development in the MDL (Alexander, 1997, 2003a, 2003b, 2006) explicitly includes cognitive and motivational aspects, with the identification of domain and topic knowledge and situational and individual interest as key variables in the model. Purposefulness is similarly evident in the goal-directed nature of deep or surface-level strategic processing, along with the description of learners' domain-related learning and knowledge-creation activities as becoming increasingly incorporated into their identities as they progress toward expertise. The context for reading development is predominantly the school context; although out-of-school reading and personal activities are mentioned, their role in reading development into and during the higher stages is not spelled out in the theory.

Ultimate aim. According to the view of reading development within the framework of the MDL, the ultimate goal of reading development is to support the construction of new knowledge in an academic domain, either in any academic domain per se (Alexander, 1997, 2003a) or specifically within the domain of reading (Alexander, 2003b, 2006). For the many learners who do not attain proficiency in an academic domain, the goal of reading development is the achievement of competence: "The ability to survive and to thrive in our world is strongly linked to achieving reading competence" (Alexander, 2006, p. 414). The meaning of reading competence in the MDL, however, has certain issues associated with the treatment of reading as an academic domain and with the domain-general or specificity of reading development, as will be discussed in a subsequent section.

Relation to wider development. Development as a reader in the MDL is clearly linked to development as a learner, with this linkage working in both

directions. Becoming a more advanced learner in an academic domain supports becoming a better reader of domain-related text and vice versa (Alexander, 1998; Alexander & Jetton, 2000). With regard to individual development, it appears that development as a learner can support development as an individual, for those individuals whose identity becomes bound up with pursuit of new knowledge in an academic domain.

Beyond this, there is no evident necessary connection of development as a reader directly to development as an individual in the MDL, although, as in the other theories reviewed, initial entry into reading (Alexander, 2003a) and progress as a learner (Alexander, 1997) are held to be supported by normal cognitive, linguistic, and physical development. Reading and interest in reading as contributors to a better quality of life and as supporting personal development are certainly acknowledged as reasons why promotion of reading development is important.

The ability to read allows one to navigate a world in which so much of interest and importance is conveyed through written language....The ability to read opens avenues for self-exploration and enrichment that would otherwise be inaccessible....Further, reading permits individuals to deepen their understanding of other critical domains of knowledge and allows them to experience feelings of pleasure, beauty, excitement, and more. (Alexander, 2006, p. 414)

However, this aspect of reading and its relation to personal development are not explicitly woven into the developmental story told by the MDL. Alexander (1997) intentionally positioned the MDL as a "mid-level theory," describing development

that occupies a level mid-way between the type of macro-level and micro-level changes addressed in other theories of learning or development.

The model I overview in this chapter sits between those two important classes of theories. That is, it is more specific than the lifespan theories of human development, but generally more integrated than those that concentrate on change in individuals' understanding of specific concepts. (1997, p. 216)

To the extent that reading development might be a larger than mid-level phenomenon, therefore, it would necessarily reach beyond the bounds of the MDL.

Domain-related complications. Alexander took a strong step toward highlighting the importance of the learner's knowledge of and interest in reading in positioning reading as an academic domain. However, a number of complications arise from this situating of reading development within the academic domain of reading. To begin with, reading has an unusual status as an academic domain, as noted earlier. Children are taught reading in early elementary school, but reading does not occur as a subject of dedicated learning and instruction beyond that point in the K-12 school system; study of reading only re-emerges as a possible academic field in college or graduate school.

Individuals who become captivated with text-based learning as a field of study, in and of itself, likely will have to wait until undergraduate or graduate school to find the mechanisms available to pursue expertise in this subject-matter domain. Until that time, the application of reading as an avenue to becoming learned in other fields or as a means of being aesthetically engaged

will dominate their school experiences, especially after the primary grades.
(Alexander, 1998, p. 269)

This creates quite an interesting situation with regard to the development of competence in reading. On the one hand, "the acquisition of domain competence requires systematic instruction" (Alexander, 1997, p. 215) due to the formalized and abstract nature of academic domains. On the other hand, learners in competence in the MDL become increasingly independent and self-directed, and can be driven to seek experiences beyond those provided in school in order to pursue their growing interest and deeper questions (Alexander, 1997).

It appears that competent developing readers might need to be particularly strongly motivated and successful at such independent and self-directed learning. They might build their understanding of the essential organizing principles of reading for the most part on their own, based on their active engagement in out-of-school reading experiences as well as their in-school reading (including not just learning the subject-matter content presented in text, but also learning about and experiencing the aesthetic and critical response to literary text that might be addressed in English class). The movement into and progression during competence in reading might therefore be particularly the province of those learners who are "intelligent novices" (Brown & Campione, 1990, p. 110) or those who have learned how to learn (Brown, Campione, & Day, 1981). Alexander (1997) singled out such learners, the intelligent novices, as singularly likely to move easily from acclimation into competence in any domain, and as likely to be more successful in learning from even unfamiliar text (Alexander & Jetton, 2000), due to their confidence and control in using general-

purpose strategies. However, their advantage might be more crucial in the domain of reading, given the apparent nature of such reading development as for the most part self-constructed during the critical period of competence.

Taken together, the flexibility in the possible developmental changes in knowledge or interest or strategic processing that promote the shift into competence as described in the MDL (Alexander, 1997) along with the necessary independence involved in developing one's own understanding of reading suggest that there are multiple possible developmental profiles and paths within this stage of reading development (Fox & Dinsmore, 2009). Alexander (2003b, 2006) specifically identified six different possible reading profiles based on the MDL variables: highly competent readers; effortful processors; knowledge-reliant readers, non-strategic processors, resistant readers, and challenged readers. Studies in which undergraduates read two differently challenging course-related texts and were assessed on the MDL variables of knowledge, interest, and strategic processing detected all of Alexander's predicted reading profiles, as well as an additional profile (the interest-reliant reader), among these generally competent readers (Dinsmore, Fox, Parkinson, & Rahman, 2010; Fox, Dinsmore, Maggioni, & Alexander, 2009).

Beyond this variability within the general stage of competence, strong individual differences in the nature of reading competence were found even within a subset of highly competent readers. An investigation of reading competence using case studies of gifted young adolescent readers found that all were indeed successful readers and learners even with difficult text from varied domains (Fox & Dinsmore, 2009; Fox et al., 2010). However, despite their manifest competence and overall

success as learners, each of these young and highly competent readers approached reading differently, and had a different orientation toward the text and its subject-matter, including an aesthetic approach focusing on personal response, an approach aiming at learning, and an approach aiming at information-getting. These differences in approach were associated with different levels of outcome performance, and were considered likely to have consequences for future reading development (Fox & Dinsmore, 2009; Fox et al., 2010).

An additional complication with the framing of reading development in the MDL is that in both the more general formulation of the MDL (Alexander, 1997, 2003a) and the special case of development in the academic domain of reading (Alexander, 2003b, 2006), development in reading is seen to be bound up with the development of subject-matter expertise. As a consequence, reading development in the MDL involves increasing domain-specificity or encapsulation in the movement toward expertise, in line with the view of expertise outlined by Schraw (2006). A window in this encapsulation is opened by Alexander's observation that with regard to development in reading as a domain, although domain knowledge per se concerns the subject-matter of reading, relevant topic knowledge will depend on the topic of the text being read, which could be reading-specific but could cover other content areas as well.

Domain knowledge refers to the breadth of one's knowledge or how much one knows about reading. Topic knowledge represents the depth of knowledge about specific topics relevant to the domain and referenced in text. Because of the nature of reading, these topics may be reading-specific, as when

students study main ideas, syllabication, sound-symbol relations, or text genres. However, because students are asked to read about a multitude of topics in reading classes and in their content courses, these topics can also run the gamut, from Harry Potter to Harry Truman. (Alexander, 2006, pp. 417-418)

She further stated that "readers' knowledge of language and knowledge of content domains are critical forces in developing competence [in reading]" (2006, p. 413), which suggests that the topic knowledge involved in reading development is unlike that involved in development in other domains, because it extends outside the specific academic domain of reading. However, the merging of domain and topic knowledge, which "become relatively indistinguishable once a learner reaches proficiency/expertise" (Alexander, 1997, p. 221) would then be particularly problematic in reading, if topic knowledge necessarily includes knowledge of topics outside the domain of reading. What exactly would the topic knowledge of reading experts look like?

A further window is opened by the specification of interest in reading as a domain, interest in the text topic, and interest in reading as an activity as all possible motivational triggers for highly competent readers (Alexander, 2006; Fox & Alexander, 2004).

As important as their knowledge base and their strategic repertoire, highly competent readers display interest in the domain of reading or topics about which they are reading. Of course, not every text these highly competent readers encounter will cover content that is familiar or personally interesting

to them. Yet in these situations, these more successful readers can draw on their well-honed strategic processes and their interest in reading to carry them forward. (Alexander, 2006, p. 427)

Highly competent readers would therefore read well across domains, even in situations in which they have low knowledge or low interest in the topic; however, the connection between this type of high competence and competence as a station along a domain-specific path to proficiency in reading as an academic domain is not clear. In particular, expertise in the academic domain of reading as described in the MDL and as observed in the reading of reading experts (Fox et al., 2005) does not necessarily entail domain-general excellence in reading. The difference between reading viewed as a domain and reading understood as an activity or behavior spanning across domains thus presents issues with regard to the domain-specificity of reading development in the MDL and the meaning of reading competence. An initial attempt at teasing apart the contributions of domain-general reading competence and of domain-specific knowledge and interest was undertaken for the domains of reading and history (Fox et al., 2005), but did not take into account readers' views of reading (within and outside the academic context) or question them on their purposes in reading.

A deeper exploratory theoretical foray into these issues was undertaken in the context of a discussion of higher-order thinking within and across domains (Alexander et al., 2011). In that discussion, a distinction was drawn between two developmental paths in reading, one in which reading development remains encapsulated and bound to a particular subject-matter (which could itself be the

subject-matter of reading), and another in which reading development takes the shape of a domain-general aptitude for and interest in learning from text as a mode of personal development.

For the first path, reading is undertaken to support content learning, while for the second, reading has more the nature of a behavior, as in the perspective on reading presented earlier. The learner on each of these paths has a different view of the object of knowledge involved in the pursuit of learning through reading; for the subject-matter oriented learner, the object of knowledge is the specific subject-matter content. For the other learner, the orientation is toward text, more specifically, toward text as a communication from an author. In that case the object of knowledge is the text as conveying the ideas and thoughts of the author. A similar distinction between an approach to reading as serving the reader's information-getting purposes or as attentive to the author's intent was made by Scardamalia and Bereiter (1991) in their consideration of literate expertise, in which they questioned the actual nature of the reading expertise demonstrated by domain experts. They pointed out that the reader's view of reading and purpose in reading bear strongly on the success of the interaction with a text as a communication with an author.

As a logical extension of the discussion offered by Alexander and colleagues (2011), a third possible path could involve an orientation toward text as a medium for aesthetic response, in which the reader's focus would be on his or her own personal response to the text. This third path would align with the aesthetic response dimension presented by Rosenblatt (1978; 2004) in her transactional theory of reading response, while the first, content-focused path would be an approach aligned

with her efferent response. The second path, in which the text is viewed as a communication from an author, allows blending of both the efferent and the aesthetic responses, and avoids the strong distinction between informational text and literature as performing orthogonal functions for readers. These three developmental paths strongly evoke the three orientations observed in the highly competent adolescent readers reported on in Fox and Dinsmore (2009) and Fox et al. (2010): reading as focused on personal response (aesthetic); reading as information-getting (efferent, content learning); and reading as aimed at personal learning (orientation toward text as communication from author).

A set of profiles resembling these three orientations was identified and given gender-related labels in a questionnaire-based study of sub-types of highly competent readers among undergraduates and graduate students (Manzo, Manzo, Barnhill, & Thomas, 2000). The major profiles identified there are the androgynous reader who is oriented toward and successful at learning from reading, the feminine reader who seeks escape in reading fiction, and the masculine reader, who seeks use-value from reading non-fiction. An additional profile is the passive or obedient reader, who reads to follow instructions and tends to get lost in the details of what is read. These profiles were further validated by Manzo and colleagues with a small-scale survey in which graduate students chose the profile that best matched their own reading approach.

However, the empirical reality of these distinct paths in reading development, and how these different profiles would be instantiated in the beliefs and reading behaviors of readers at the high end of development remain yet to be investigated.

Looking Across the Theories

Having considered these five theories of reading development and their projected responses to the questions arising from the perspective on reading development adopted here (overviewed in Table 1), the remaining step is to consider how each informs and supports the theoretical and investigative frame for the study undertaken. This comparative consideration will be organized by the columns in Table 1: specification of the highest stages in reading development; aspects of reading addressed; developmental mechanisms identified; environmental interactions supporting reading growth; the relation of development as a reader to other forms of development, and the ultimate aim of reading development, as framed by the understanding of the nature of reading in each theory.

Highest stages. The identification of the highest stages of reading across all of these theories in general hinges upon the reader "becoming able to participate in the behavior of reading in ways that support one's purposes and satisfy one's needs" (Fox & Alexander, 2011). However, the theories differ in where they locate these stages in relation to general and academic development, and in the types of purposes and needs that are supported. For Gates (1947), higher reading development encompasses an intermediate stage in late elementary school (4th through 6th grades) and a mature stage beginning after 6th grade. Gray's initial formulation of his theory of reading development (1925b, 1937) was the same; however, in his later investigations of maturity in reading (Gray & Rogers, 1956), Gray proposed an additional level of full maturity to be achieved in adulthood, and achievable by very few adults. A similar division of higher reading development into three levels

appears again in Gibson and Levin's (1975) discussion, as the transition into skilled reading, learning from reading, and fully mature reading, although no specific age or grade levels are attached. Chall (1983) distinguished an additional step in the movement from learning from reading to maturity, with her identification of the stages of learning from reading (4th through 8th grades), multiple viewpoints (high school), and personal knowledge construction (college and above). Finally, for Alexander (1997), the stage of competence in domain learning is typically achieved by the end of high school, while proficiency is for those who have moved on to graduate study and a career in a particular domain.

The identification of the highest stages of reading development across these theories, then, includes becoming successful at learning from reading in school (Gates, Gibson & Levin, Chall, Alexander) and then moving on to construction of one's own knowledge, either with regard to a particular academic content domain (Chall, Alexander) or as an aspect of personal, rather than strictly academic, development (Gray). In all of the theories other than that of Gates, reading development has a typically adult stage in which full maturity can be reached, different in kind than the reading at earlier stages, however successful or skillful that might be. For the purposes of the current study of the nature of mature reading, looking at readers who are pursuing advanced study in graduate school will provide a glimpse of what it would mean to stop short of maturity in reading, to be moving into maturity in reading, or to be operating as a fully mature, competent, or expert reader from the standpoint of these theories. Graduate students would typically be expected to have arrived at competence in learning from text, and to be on the verge of or into

the stage of working to construct their own knowledge about a specific subject-matter. Further, they would typically be at a level of maturity in other aspects of their development that would allow reading maturity of the type identified by Gray to show through, should it be present.

Aspects of reading addressed. At a minimum, each of these theories considers reading as clearly having cognitive aspects, although for Gibson and Levin (1975), the perceptual aspects of reading development are theoretically more central. Issues of motivation and purposefulness as bound up with reading development are also forwarded by all of the theorists but Gates (1947), who left purpose in the hands of the content-area teachers. The explicit situation of reading development primarily within the school context is seen for Gates (1947), Chall (1983), and Alexander (1997, 2003a, 2003b, 2006). Gibson and Levin (1975) did not directly discuss context as important for understanding reading development; their emphasis on purposes as shaping the nature of the reading to be done indirectly acknowledges a role for context, but the origin of these purposes as arising from the nature of a particular reading context and as having their meaning within that context is not considered.

Gray (1925b, 1937, Gray & Rogers, 1956) stands alone among these theorists in explicitly including in-school, out-of-school, and beyond-school contexts as important to reading development. He also explicitly considered two other aspects of reading not directly or centrally discussed by the other theorists: reading as a communicative interaction, and reading as having real transformative power in the sense of contributing essentially to personal development. The breadth of Gray's lens

on reading development provides an important counterbalance to the focus on schooled reading and reading as supporting only academic development or addressing primarily academic knowledge-building purposes; his lens equally encompasses not only the beyond-school place for reading as supporting the fulfillment of duties or responsibilities as an adult or citizen but also reading as potentially woven into the individual's pursuit of meaning and purpose in life.

One clearly important issue that arises from the side-by-side consideration of these theories is the situation of reading development primarily within the school context or the view of it as including also the reading that occurs in other areas of life and to fulfill other types of purposes. A further and related issue is the degree to which it is necessary for increasing competence in reading to be linked with subject-matter knowledge, subject-matter interest, or status regarding subject-matter expertise. It becomes evident that issues of context, of purpose, and of the relation of reading development to learning are at the heart of these different conceptions of higher-level reading development. These issues therefore need to be equally at the center of the current investigation of the nature of mature reading. With regard to the current study, it is further evident that Gray's perspective on maturity in reading (as signaled by the aspects of reading he took into account) is most closely aligned with the perspective on reading adopted here. His study of maturity in reading (Gray & Rogers, 1956) provides the model from which the investigative framework for the current study is adapted.

Mechanisms of growth. The mechanisms by which readers progress into and continue to grow during the higher stages of reading development have a number of

similarities across the theories reviewed. These mechanisms include assimilation (both as accumulation and as refinement or tuning), accommodative restructuring, and expansion/narrowing of interests.

In all of the theories, some form of refinement or tuning of techniques or skills is identified. This refinement or tuning is further held to support a shift of attention from the execution of the skills or techniques to their more automatized use in the pursuit of higher-level and purpose-directed questions. Gates (1947) and Gibson and Levin (1975) particularly emphasized the developmental importance of this tuning to the circumstances of particular reading situations and the resulting matching of well-automated techniques and higher-level reading purposes that they saw as characterizing more-skilled reading. Gibson and Levin (1975) went into particular detail about what refinement meant in terms of perceptual learning, singling out economy and adaptiveness as core principles. Beyond refinement of skills, Gray (1925b, 1937, Gray & Rogers, 1956) also spoke of reading attitudes, habits, and evaluative standards as undergoing refinement during the course of higher-level reading development.

Additional assimilative growth comes in the form of accumulation. Accumulation of vocabulary or content knowledge is acknowledged as a contributor to reading development by Gibson and Levin (1975), Chall (1983), and Alexander (1997, 2003a, 2003b, 2006); for Alexander, restructuring of knowledge is necessary as well. Gray (1925b, 1937, Gray & Rogers, 1956), on the other hand, tended to emphasize the accumulation of wide and deep reading experiences rather than of a body of knowledge.

Beyond the restructuring of knowledge noted earlier in Alexander's theory, accommodative restructuring comes into play in higher-level reading development in relation to the reader's conception of reading and its purpose. Restructuring occurs with regard to evaluative standards (Gray), the understanding of reading (Gray), conception of reading and associated reading processes (Chall), and learning purpose (Alexander). Gray and Alexander additionally addressed changes in the reader's interests; for Alexander, this change is predominantly a narrowing and focusing of interest on a particular domain. For Gray, readers in the highest stages of reading development experience both an expansion and a focusing of interest, as they broaden the scope of what can be interesting to them, while also becoming more focused in the shape of that interest.

Important issues for the current study that arise from this comparison include the nature of the changes in knowledge and interest that are likely to be implicated in higher-level reading development, and the degree to which they are bound up with content-area knowledge, interest, or expertise. Beyond interest, the other aspects of purposefulness discussed previously as part of this perspective on reading are also important in trying to understand higher-level reading development, that is, the reader's epistemic orientation, goals, and identity. A particular issue to be raised here is the type of purposefulness supporting the learning of the intelligent novice. For instance, how are these effective learners epistemically oriented to the reading situation as a learning situation per se? Here, too, the connection to content-area learning emerges as problematic. Again, Gray stands out from the other theorists due to the breadth of his perspective, in which refinement of reading attitudes and habits,

expansion of reading interests, and accumulation of wide and deep reading experiences are important for growth as a reader. These broader aspects of reading development also need to be taken into account in the current investigation of mature reading.

Environmental interactions. All of the reviewed theorists consider school-related reading activities to be an important contributor to higher-level reading development. A variety of types of encounters with text outside those met with in school are incorporated into the discussions of reading development by these theorists, with the exception of Gates (1947). Gray (1925b, 1937, Gray & Rogers, 1956) recommended extensive independent reading of worthwhile, challenging text. Gibson and Levin (1975) emphasized the importance of multiple exposure to text and to varied text types, particularly informational text. For Chall (1983) wide reading is important, while for Alexander (1997, 2003a, 2003b, 2006), independent explorations in pursuit of self-generated domain-related questions support academic/reading development.

Beyond content-area reading tasks, other instructional or school-related interactions identified as contributing to higher-level reading development include: skill- or strategy-building instructional programs (Gibson & Levin); instruction about reading processes (Gray); the writing of integrative essays (Chall); contact with a mentor (Chall, Alexander) or participation in a disciplinary discourse community (Alexander); and specific instruction and practice related to the development of domain expertise (Alexander). Gray also included the formative experience of

literary analysis, based on the findings from interviews conducted in his study of maturity in reading (Gray & Rogers, 1956).

For the purposes of the current study, comparison of the types of environmental interactions seen as important for higher-level reading development across the reviewed theories suggests that content-area reading experiences, reading-related instruction, and breadth and depth of independent reading are important areas to inquire about in the investigation of mature reading. The potential role for formative exposures to particular reading experiences by way of mentorship, writing, or literary analysis would be additional environmental interactions that could possibly shape higher-level reading development. Each of these types of formative exposure evokes the communicative aspect of reading, which suggests further that some form of sensitivity to such communicative aspects may also be active in higher-level reading development.

Development as a reader. Development as a reader is seen to be related to development as a learner and to individual development across all five theories reviewed. However, the directionality and scope of these relations varies from theory to theory. For Gates (1947) and Gibson and Levin (1975), the movement is from normal development as an individual to development as a reader to development as a learner. Gibson and Levin additionally specified that growth as a learner (in the sense of accumulation of knowledge and vocabulary) would support continued growth as a reader. For Chall (1983) and Alexander (1997, 2003a, 2003b, 2006) development as a learner and as a reader are mutual. Alexander further suggested that growth as a learner supports growth as an individual, with the progression to domain expertise as

a learner becoming increasingly bound up with the individual's identity. For Gray (1925b, 1937, Gray & Rogers, 1956), on the other hand, development as a reader and as an individual are mutual. Growth as a reader also supports growth as a learner for Gray, while growth as a learner (in the sense of increased education) supports growth in reading competence in the form of successful comprehension.

For the purposes of the current study, this comparison again suggests that the intersection of reading, content-area learning, and individual development is a particularly problematic junction, and will be viewed differently depending on the breadth of the view of reading and of the ultimate aim of reading development. In particular, it is of interest to consider what the readers' own views of this interconnection are, and of the degree to which they consider their own growth as a reader, a learner, and an individual to be interrelated and mutually supportive.

Aim of reading development. Views of the nature of reading and of the ultimate aim of reading development show clear and critical differences across the theories reviewed. For Gates (1947), reading is simply a tool, and the aim of reading development is the successful use of that tool in supporting content-area learning. Similarly, for Gibson and Levin (1975), reading is a higher-order perceptual skill, and the aim of reading development is to support success in extracting needed or desired information in fulfilling adult purposes. Chall (1983) saw reading as form of problem-solving process, with the aim of reading development being to support successful functioning in our knowledge-based society (Stage 4), or in academics (Stage 5). For Alexander (1997, 2003a, 2003b, 2006), the nature of reading takes on two forms: as a learning activity in academic domains, or as itself an academic

domain. The ultimate aim of reading development in that case is to support the construction of new knowledge, which could be knowledge within any academic domain or within the specific domain of reading.

In these theories, reading is seen as fundamentally instrumental, and the highest level of reading development aims at its use in supporting different forms of adult activity: generalized purposes (Gibson and Levin); participation in the economy (Chall); and participation in academic discourse and knowledge construction (Chall, Alexander). For Gray (1925b, 1937, Gray & Rogers, 1956), on the other hand, reading is not seen as fundamentally subservient to other purposes, being rather more of an end-in-itself. Gray treated reading as having the nature of a behavior, and viewed the ultimate aim of reading development to be its capability of supporting self-fulfillment, which it could do by providing a tool, and also by providing the particular form of self-chosen and self-regulated engagement with the ideas and experiences of others that it offers.

For the purposes of the current study, this evident difference across theorists in conceptualization of reading and of the aim of reading development suggests that the investigation of the nature of mature reading must take into account the instrumental role of reading in which reading development at higher levels allows the pursuit of higher-level knowledge-building purposes and supports more consistent and complete success at accomplishing such purposes. It must equally allow for the possibility that in higher-level reading development, readers become open to reading as supporting personal development and self-fulfillment in aspects beyond just accumulation or construction of knowledge within academic domains.

Reading Maturity

As the discussion of theories of reading development has made evident, a variety of views of what would be considered to be reading maturity have been proposed from a developmental standpoint, with one critical distinction being the degree to which the focus is on personal versus academic roles and uses of reading. When the focus is primarily on reading as supporting accumulation and construction of knowledge for academic purposes, reading maturity ends up taking the form of expertise in reading in a particular subject-area (e.g., Alexander or Chall), or of a broader set of specialized skills supporting learning across content areas (e.g., Gates, Gibson and Levin). Maturity as reading expertise is a subset of the learner's larger capabilities as a domain expert, and operates at the nexus of subject-matter knowledge, familiarity with and adeptness in negotiating the domain's territories and its indigenous discourse conventions, and interest in the domain and its defining questions and modes of inquiry. Maturity as general competence relates to the reader's adaptive flexibility in using reading to accomplish presented learning tasks. When the focus is primarily on reading as having personal roles and uses, or amateur rather than professional reading (with the term *amateur* bringing along with it the link to the idea of loving an activity for its own sake), reading maturity is viewed as pertaining to the behavior of reading itself (e.g., Gray).

The idea that the very best reading is the reading done by professionals (i.e., domain experts reading in their area of expertise) makes sense from a number of standpoints. The expert has domain-related skills, interests, and particularly domain-related background knowledge that are expected to contribute together to excellence

in performance when reading domain-related texts. The expert is expected to come to the text with questions, to interact with the author critically and effectively, and to be in general positioned toward the text in a way that promotes deep comprehension and evaluation based on appropriate disciplinary criteria. The extent to which a reader can read in this way as appropriate for a particular subject-matter will then be the extent to which he or she approaches expertise in reading.

However, the idea that reading maturity is achieved with regard to reading itself rather than in relation to a particular academic subject matter also makes sense, from a different standpoint. It suggests a larger, cross-domain scope for the reader's capabilities, in which there could be an important role for knowledge, familiarity, and interest operating in relation to reading itself and to the text *as* a text; that is, as a communication from an author, rather than primarily in relation to the content. Although mature or highly competent readers of this type could have built up a relatively large store of content-area knowledge and familiarity with a variety of text structures and text types due to their more general interest in reading and learning, their consistently excellent reading performance should be relatively independent of the need for dedicated subject-matter knowledge and interest that is hypothesized to be operating in the idea of reading expertise as arising from domain expertise. The idea of reading maturity as a general competence sits between these two, with its suggestion of cross-situational consistency on the one hand and its origin in a focus on academic reading and learning from content-area text on the other.

An important issue is to what degree cross-situational consistency would reflect a more general, but perhaps low-level reading competency, a kind of low-

grade professional reading oriented toward subject-matter learning, and to what degree it would result from the reader's stance with regard to reading itself and reflect a more amateur attachment to reading, learning, and self-development. For example, either or both of these two types of cross-situational consistency could be behind the reading of the proficient adult reader envisaged in the RRSB Report (2002), who can "read a variety of materials with ease and interest...read for varying purposes, and...read with comprehension even when the material is neither easy to understand nor intrinsically interesting" (p. xiii), the highly competent reader of Alexander (2003), and the developmentally mature androgynous profile identified by Manzo and colleagues (2000).

The question then is, how has the field taken up and addressed these three ideas of reading maturity? The conceptualization of reading maturity as a form of expertise, as a set of skills, or as more like a behavior should make a difference in who are identified as expert, mature, or highly competent readers, in how their performances are assessed and evaluated, and in the interpretation of and implications drawn from the findings. Further, behind any investigation of reading maturity will lie a (possibly implicit) theory of reading development in which this version of reading maturity is the desired endpoint, while behind that is a (possibly implicit) understanding of the nature of reading. The final step in framing the current study is to look at how the highest stages of reading development have been conceptualized as forms of reading maturity, operationalized and investigated empirically, and what has been learned about them. It is important to consider the degree to which the tension

between these three views of reading maturity is acknowledged or accommodated in the conceptualizations and investigations of reading maturity discussed.

Conceptualizations of Reading Maturity

Scardamalia and Bereiter: Knowledge-transforming. Scardamalia and Bereiter (1991) addressed reading maturity from the standpoint of expertise, and offered a somewhat skeptical view of experts as expert readers. Scardamalia and Bereiter began their discussion of expertise in reading by pointing out that, in contrast to expertise in writing, "...reading expertise sounds a bit odd. Because reading produces no distinct product, and because its effects are always joined with those of domain knowledge, it has a more ambiguous status" (p. 182). They pointed out that the well-demonstrated contributions of domain knowledge to reading performance constitute sufficient evident for most psychologists that there is no such thing as reading expertise.

Even in cases where reading and writing are both judged important, many modern psychologists would rate their contributions differently. They would see writing as quite separable from expertise in the field. Reading, however, they would see as inseparable. Reading researchers have stunningly demonstrated that how well one will understand a written text will depend preeminently on the extent of one's knowledge of the field discussed in the text...According to the resulting knowledge-based or "schema-theoretic" view, there is no general expertise in reading. Beyond a few basic skills, one's expertise in a particular area is coextensive with one's knowledge of the area. (pp. 174-175)

Nonetheless, Scardamalia and Bereiter posited that reading expertise is indeed a real phenomenon, and that expertise in reading can be seen to have parallels to expertise in writing and to other more traditional forms of expertise.

Scardamalia and Bereiter (1991) situated their conception of reading expertise in relation to the Construction-Integration (C-I) cognitive processing model of comprehension proposed by Kintsch and van Dijk (1978; Kintsch, 1998). Of particular interest for their purpose was the supposition in the C-I model that readers construct mental representations of text on two different levels, and that both levels of representation together support successful comprehension and learning from text. In the C-I model, readers construct a textbase, representing the propositional structure and content of the text, and a situation model, representing what the text is presenting to be the case in terms of a situation in the real or fictional world described. Different types of processing and access to different types of prior knowledge are required for the construction of each of these levels of representation.

Accuracy and coherence are desirable in the textbase, while elaboration and integration of the text content with the reader's own knowledge make for a well-constructed situation model. Expert reading for Scardamalia and Bereiter involves moving beyond just constructing a coherent textbase to developing an integrated situation model, for difficult domain-related texts. Skilled readers can develop coherent textbases relatively easily—it may not demand much engagement with the text, depending on its level of difficulty and their level of knowledge, and can result in effective recall. Scardamalia and Bereiter characterized an approach to reading that focuses only on this level of representation as similar to what they had described

elsewhere as knowledge-telling, with an emphasis on literal reproduction of the text and sentence-by-sentence processing. To go beyond that and develop an integrated situation model involves asking what the text means, forming an interpretation and integrating it with prior knowledge and experience, which Scardamalia and Bereiter characterized as a knowledge-transforming approach in which new knowledge can be developed. Scardamalia and Bereiter (1991) pointed out that ideally, an expert reader would attend well to both of these constructive activities.

Really expert reading, observed only rarely in school-age readers, would involve cycles of attention to textbase and situation model, modifying each in response to problems arising from the other, much as we observe in expert writers. (p. 185)

However, Scardamalia and Bereiter (1991) suggested that domain experts are not necessarily expert readers in this sense, and that many in fact are quite inexperienced. They argued that domain experts are likely to attend primarily to the construction of the situation model, in their focus on the big picture and their scavenging for new potential additions to or modifications of their knowledge base. The very familiarity of domain experts with the typical text structures and text types used in the discourse of the domain supports this bypassing of careful attention to the actual textbase being presented; the building of one's own situation model then comes to take precedence, with the possible consequence of misreading and misrepresentation of the actual content and neglect of the author's communicative intent.

In acquiring expertise in a domain, constructing situation models is obviously what counts most. Our hypothesis is that, indeed, it counts for so much that

people striving to attain expert knowledge in a domain will be inclined to concentrate their efforts on building and tuning their situation models and accordingly will put as little effort as they can into constructing textbases. Such neglect of the textbase maximizes immediate gains in new knowledge at the expense of possible significant revisions or even major transformations of existing knowledge. (p. 185)

Scardamalia and Bereiter (1991) presented evidence from studies of domain experts reading to support this supposition that domain expertise per se might not, in fact, result in expert reading. They argued that such findings, together with their framing of expert reading according to the C-I model, would position expertise in reading as both theoretically and empirically distinguishable from domain expertise. Although domain-related knowledge does support the construction of a well-integrated situation model, expert reading in their view requires as well an approach to reading that acknowledges the need to attend to the text itself and to the author's intent and specific choices, as well as attending to the relation of the situation model presented to the reader's own situation model. Their view also suggests that expertise in reading could function as a way to learn deeply and well across subject-matter areas, when the reader's knowledge is sufficient to support the construction of a situation model, arriving back at the idea of a domain-general reading proficiency that can support the behavior of reading for self-development.

Pressley and Afflerbach: Constructive responsiveness. The idea of maturity in reading was somewhat indirectly addressed by Pressley and Afflerbach (1995) with their empirically-based portrait of excellence in reading and its

connection to domain expertise. On the basis of their synthesis of the findings from research using verbal protocols during reading, Pressley and Afflerbach arrived at the view of excellent reading as "constructively responsive" (p. 83). They further explicitly identified constructively responsive reading as a type of expertise, arguing that its attributes and its likely developmental path mapped well onto more general models of expertise and its development. They felt that their model of excellence in reading or reading expertise framed as constructively responsive reading represented a more complex and inclusive portrayal of the nature of excellent reading than had the other theoretical models of reading and its processes that they reviewed.

In the view of Pressley and Afflerbach (1995), the fullest instantiation of constructively responsive reading was seen in the reading by domain experts of domain-related texts in their specific area of expertise. They explicitly addressed the question of whether constructively responsive reading would only be seen from a domain expert reading in the area of expertise, and concluded that:

It is logically possible that learning to read constructively and critically in one domain would have carry-over effects to other domains. Whether (or how much) constructive responsivity depends on prior knowledge has yet to be determined. (p. 108)

Because they saw development of reading expertise as likely to be particularly linked to development of domain expertise, they framed the question as one of carry-over effects from learning to read expertly in one domain, rather than as relating to the possible domain-generalty of reading expertise development.

In their discussion of the findings from research using verbal protocols to investigate reading, Pressley and Afflerbach (1995) noted the evident influence of domain expertise on various aspects of performance related to excellence in reading in their view. However, they were also careful to indicate that being on the more expert side of a novice-expert comparison in these studies was not always related to degree of domain expertise or domain experience; there were also studies in which comparisons were on the basis of reading ability alone. As a consequence, Pressley and Afflerbach used double-barreled language such as "better and/or more experienced readers in a domain" (p. 106) and "more and less able and/or more and less experienced readers in a domain" (p. 107) to reflect this duality. Domain expertise was not the only possible path to excellent reading. Being a more able reader or a better reader (however that might be determined) was also associated with greater constructive responsiveness in reading, although Pressley and Afflerbach did emphasize that the fullest or best examples of constructively responsive reading tended to be seen from domain experts. However, the excellent reading by domain experts pointed to by Pressley and Afflerbach (1995) would, on the view of Scardamalia and Bereiter (1991) result from a combination of expertise in reading and domain expertise.

Pressley and Afflerbach (1995) generated a composite portrait of the constructively responsive reader based on their analysis of the verbal protocol findings.

In conclusion, the composite reader who emerges...is after the big ideas in text. The reader comes to the task with some general tendencies: for example,

to overview the text as a way to begin understanding it and to plan reading of the text; to read from the front to the end of the text in general, but to veer off this course when comprehension requires processing of information found elsewhere in the text; to use strategies...in coming to terms with text, including predicting, visualizing, summarizing, rereading as needed, and so on; to monitor comprehension and other aspects of reading as part of the strategic planning process that continues throughout the reading; and to relate the information in text to prior knowledge, permitting both formation of hypotheses about the meaning of the text and evaluations of the text and the hypotheses. How these general tendencies play out depends largely on the nature of the text. That is, the general meaning construction tendencies of the skilled reader are shaped into specific responses to a particular text largely by specific characteristics of the text and information in it. (pp. 104-105)

This portrait does not specifically invoke domain expertise; however, being positioned to go after the big ideas in text is typically seen as a by-product of greater experience, knowledge, and familiarity (e.g., Scardamalia & Bereiter, 1991). Pressley and Afflerbach (1995) noted the importance of text-related prior knowledge for supporting the comprehension monitoring and evaluative response seen in constructively responsive reading. In addition, level of engagement and passion during reading were also related to degree of meaningfulness of the reading experience, with domain experts likely to be most deeply and engaged and passionate, and likely to situate their domain-related reading "in the context of meaningful activity" (p. 104).

Geisler: Socialization into a cultural practice. A somewhat different angle on the conceptualization of reading maturity as a form of expertise is that forwarded by Geisler (1994) in her discussion of academic literacy. Geisler argued that the practices associated with academic literacy (i.e., the reading, writing, and other discourse practices engaged in by members of the academic community) have the effect of creating a separation between the members of the academy and those outside it. On this view, expertise with regard to academic literacy is deliberately restricted to members of the academic community, who arrive at it by way of socialization into the community's rhetorical discourse practices, a path that is not open to those who do not choose to pursue academic careers. Geisler argued that the practices of schooling help to create this separation by orienting students to treat academic texts as simply content bearing and as non-rhetorical. Not until students have reached the more advanced stages of domain-specific learning as undergraduates and more especially graduate students are they encouraged (or allowed) to interact with academic texts as having both rhetorical and domain content aspects. Geisler saw the creation of this divide as part of the movement toward professionalization of academics, and as having the effect of protecting the status of those in the academy, making them indispensable as creators and interpreters of academic forms of discourse and knowledge.

My main argument...is that the cultural movement of professionalization has used the technology of literacy to sustain claims to professional privilege, creating a *great divide* between expert and layperson. Academic literacy has had this effect, I suggest, via a *dual problem space framework* that bifurcated

expertise into two distinct components, domain content and rhetorical process.

(p. xiii, emphasis in the original)

Geisler (1994) claimed that the progression toward this type of expertise was not along a more typical developmental continuum, but involved a sharp discontinuity between the type of reading and learning going on prior to entry into academic specialization and that undertaken upon socialization into the culture of academic discourse practices.

Expertise is not simply a developmental phenomenon. It is simply not the case, for example, that students in the general curriculum are taught to read in a way that must only be further developed when they go on to the university. After 14 years of being taught that the text has all the answers, is it any surprise that some students find it hard to understand that they must read rhetorically, that they must ask about the author's purpose and context in order to use knowledge productively? Even those who operate as experts in one domain resort to relatively naive strategies in other domains and take texts at face value...In each area of specialization, then, students must actually be untaught the distrust of personal opinion and contextualized understandings that has been drummed into them through the period of general education. (p. 93)

For Geisler (1994), expertise in reading was entirely bound up with domain expertise, because she saw no way for a reader to become aware of and competent in maneuvering with regard to the rhetorical aspect of the reading problem space without being socialized into such awareness and competence, that is, by becoming a

member of that particular discourse community and thus being given access to its metadiscourse.

The circuitous development of rhetorical process practically guarantees that experts will be the only ones able to use a field's texts in any kind of sophisticated manner, will be the only ones who can sustain serious interaction or invite serious response on specialized content. (p. 94)

Her contrast to the expert was on the one hand, the student, and on the other hand, the general public or the layperson, but the status of either with regard to reading itself as a practice or as a behavior across situations was not considered. She did discuss the idea of scientific or philosophical texts as having been formerly more accessible to the general reader or the amateur learner, and noted that William James as an author was particularly interested in making his ideas available for amateur as well as specialist readers.

Geisler's (1994) evocation of a certain kind of elitism in association with the idea of reading expertise, although somewhat extreme, is nonetheless worth further consideration. The tendency to equate the very best reading or the highest form of reading development with what academics are able to do when reading in their area of academic specialization has surfaced in multiple ways in the theories of reading development and conceptualizations of reading expertise discussed thus far.

However, this equation is not immediately evident from the standpoint of reading taken as a complex communicative behavior that develops over the lifespan; we would not necessarily expect to find mature readers only within the ranks of university professors, and mature reading relating only to the furthering of academic

knowledge. Somehow, to academics studying reading, expert reading tends to look very much like what they themselves do, and the endpoint of reading development tends to look very much like becoming like them. Rosenblatt (1978) brought up a similar issue with regard to literary analysis viewed as a form of reading expertise related to the reading of literature.

My concern is simply with the social and intellectual atmosphere that sets up "good literature" as almost by definition works accessible only to the elitist critic or literary historian, and that leads the average reader to assume that he simply is not capable of participating in them. Our whole literary culture tends to produce this defeatist attitude. (p. 142)

Although domain expertise can be seen to contribute to certain aspects of expert reading in all of these conceptualizations of reading maturity as expertise, there is also a critical and apparently unsuppressible role for what the reader can do with regard to reading itself, although this role has stood somewhat in the background thus far. In particular, the reader's view of or approach to reading and how this might change across situations appears to matter; it could be important to consider how such a view or approach would be active in the reading done outside as well as inside the academic context, and what it would mean to have a consistently rhetorical, knowledge-building, constructively responsive stance. In the final conceptualization of mature reading to be discussed, amateur reading, personal uses of reading, and reading as a behavior are moved to the fore, and content-area or subject specialization becomes only one possible element in the larger portrait of reading maturity that is thus framed.

Gray and Rogers: Eager, effective, independent participation. As a step in the establishment of the framework for their investigation of the nature of reading maturity and how best to appraise it, Gray and Rogers (1956) devoted their third chapter to addressing the concept of maturity in reading. They first gathered together ideas about general maturity and how it had been viewed by those who study human development, and then moved to the consideration of maturity in reading as it had been viewed by those who study reading. They found, however, that this was no easy task with regard to reading, due to the lack of clarity and specificity as well as the overlap between views. They therefore distilled from the literature a selection of ideas about maturity in reading that would represent current viewpoints.

From these, Gray and Rogers (1956) arrived at a set of seven characteristics of a mature reader that present a much broader picture of maturity in reading than the expertise-based descriptions seen thus far. Their mature reader would have: enthusiasm for reading; the habit of wide reading of a wide variety of materials that would support personal development and growth as well as intensive reading in a particular area of interest; ability to grasp meanings, ideas, mood, and feelings from text; successful and consistent use of available knowledge in deriving meanings from text; ability to read critically, based on both emotional and cognitive response to text; the ability to grow from reading, with regard to knowledge, interests, attitudes, patterns of thought and behavior, and personality; and appropriate flexibility of reading pace. These characteristics could be more fully understood and potential conflicts between or within them defused by taking into account as well the characteristics of general maturity that had also been discussed, in particular, maturity

of perspective, maturity in social values or standards, and a mature awareness of when different types of response would be appropriate.

Gray and Rogers (1956) described general maturity as, "distinguished by an adequate development of each individual's attitudes, understandings, and abilities to enable him to participate fully and creatively in the all-round business of living" (pp. 55-56). They wanted to make the point strongly that arrival at maturity is not simply the reaching of a particular, culminating level of achievement, but means rather continued growth and enrichment. For development in reading as well, maturity in reading is not an endpoint, but a blossoming of the capacity for continued growth.

Maturity in reading as one aspect of total development is distinguished by the attainment of those interests, attitudes, and skills which enable young people and adults to participate eagerly, independently, and effectively in all the reading activities essential to a full, rich, and productive life. It is assumed that, in the satisfaction of interests and needs through reading, a mature reader will continue to grow in capacity to interpret broadly and deeply. (p. 56)

Maturity in reading, for Gray and Rogers (1956), is supported by a set of abilities, tendencies, and capacities relating to reading as interpretive, communicative, knowledge-building and knowledge-dependent, purposeful, transformative, and complex. It is interesting to note that they included the idea of intensive reading in a particular area of interest, which had been suggested to them by the views of mature reading offered by Center (1952) and Strang (1942). This intensive reading in a particular area of interest, however, is something that mature readers are thought to do as mature readers, part of their typical pattern of behavior. There was no

suggestion by Gray and Rogers that mature readers are limited in their scope of learning to that particular area of intense interest, nor that such reading is required to arrive at the stage of maturity in reading.

The contrast between this view of reading maturity as amateur reading and the type of professional reading maturity seen in the other views of reading maturity as expertise or as expertise-related is evident and strong. However, each of them specifies that maturity in reading involves knowledge, interest, skills, purposes and aims in reading, and varying levels of interaction with the text and its author in order to comprehend, interpret, critically analyze, and internalize what it has to offer. Each of them, directly or implicitly, also invokes the reader's understanding of what is supposed to happen in reading, or the reader's perspective on reading, either in general or in this specific reading situation. These aspects of maturity in reading are important to bear in mind when considering how reading maturity has been investigated empirically.

Investigations of Reading Maturity

A critical issue in the study of reading expertise is the operational definition of the mature reader, and the type of individual difference variables that are assumed to be of interest in determining possible relative or absolute levels of maturity in participants. Along with the definition of maturity, there are also associated issues of what aspects of reading performance are considered, which can include both what goes on during reading and the type of outcome assessed. Finally, there are also the standards applied in judging the aspects of performance that are taken into account.

Three relatively distinct paths have been followed in the research in operationally defining mature reading, although there are areas in which they overlap. One direction for investigating reading maturity has been expertise-oriented, and has seen the pinnacle of reading development to be the specialized, professional reading of domain experts. Another direction has been to see greater reading maturity, that is, more advanced reading development, manifested by greater competency in cross-situational reading, as measured by a test of reading comprehension or as associated with greater age or school experience. The third direction is to consider greater reading maturity to be related to a more sophisticated, knowledge-building, critical approach to text, which would be likely to lead to both successful comprehension and higher-level outcomes such as critical evaluations or comparisons. The first direction takes reading maturity as content domain-specific, while the latter two address reading across domains.

Expert reading. The expert reading of domain experts has been extensively investigated. According to the general characteristics of expertise based on the findings of expertise research, an expert in a given domain possesses a comprehensive and well-organized domain-specific knowledge base, has a complex and well-developed set of domain-specific skills and problem-solving strategies, consistently performs at the highest level on domain-related tasks, and has developed such expertise over much time spent in deliberate practice involving interaction with domain-related content (Bereiter & Scardamalia, 1986, 1993; Ericsson & Smith, 1991; Schraw, 2006). With regard to reading in particular, the domain expert is expected to be highly interested in domain texts and learning from domain texts

(Alexander, 1998; Alexander & Jetton, 2000; Pressley & Afflerbach, 1995; Scardamalia & Bereiter, 1991), and well-versed in domain discourse conventions including such aspects as typical text structure, (Dillon, 1991; Dillon & Schapp, 1996; Kintsch, 1980; Kintsch & Yarbrough, 1982) and the appropriate use of argumentative rhetoric (Geisler, 1994). Of the models of reading development discussed, the expert reader thus understood would be most strongly aligned with Alexander's (2003b, 2006), which is situated within a more general model of expertise development, the MDL (Alexander, 1997, 2003a).

In this line of research, a reading expert is taken as an expert (or developing expert) in some domain, such as anthropology, chemistry (Afflerbach, 1990b), biology (Charney, 1993; Haas, 1995); history (Wineburg, 1991a, 1991b, 1998; Leinhardt & Young, 1996; Rouet, Favart, Britt, & Perfetti, 1997), law (Christensen, 2008; Lundeberg, 1987), physics (Bazerman, 1985; Dee-Lucas & Larkin, 1988), political science (Schooler, Kennet, Wiley, & Voss, 1996), sociology (Schwegler & Shamoon, 1991), social sciences (Wyatt, Pressley, El-Dinary, Stein, Evans, & Brown, 1993), teaching (Shearer, Lundeberg, & Coballes-Vega, 1997), literature (Graves, 2001; Zeitz, 1994), or poetry (Peskin, 1998), who is given a research task involving reading in his or her area of expertise. When a corresponding novice comparison is made, the novice is usually someone with less or much less experience in the relevant domain who is given the same task. Domains of expertise outside academia have also been investigated, as in the case study of Dutch legislators and their reading in preparation for making speeches on policy decisions (Neutelings & Maat, 1997).

The researchers undertaking these studies of expert reading have been interested both in what the expert does or can do while reading and in the outcomes arrived at, although not all of these studies have investigated both. Along with observing or describing expert reading behaviors in descriptive, exploratory studies, researchers have also manipulated or constructed the reading task in a way presumed to elicit certain types of reading behaviors (for example, presenting conflicting information to evoke monitoring or cross-textual comparison, or omitting bridging material to force inferences) or offer the opportunity for them to emerge. In either case, it is often desirable to track what readers are thinking and doing as they read.

The reader's ongoing reading behaviors have frequently been tracked in these studies by using think-alouds (e.g., Wyatt et al., 1993), in which the reader verbalizes what he or she is aware of thinking and doing while reading. This methodology can capture (at least to some degree) what is going on in the way of planning and strategic activities during reading, along with evaluative and affective responses to which the reader has conscious access (Afflerbach, 2000; Fox, 2009; Kucan & Beck, 1997; Pressley & Afflerbach, 1995; Olson, Duffy, & Mack, 1984), although there are limits to the completeness of the reports, and participants typically vary widely in their tendencies to verbalize freely. Researchers in these types of studies also have gotten at what readers are doing while reading with interviews, retrospective reports, or combinations of these (e.g., Lundeberg, 1987); these methodologies can elicit readers' explanations or perceptions as well as their reports of what they were conscious of doing or thinking.

Research tasks in this line of research have included the reading of both single and multiple texts that could be researcher-chosen (e.g., Graves, 2001; Wineburg, 1998) or participant-chosen (e.g., Shearer et al., 1997; Wyatt et al., 1993). Length of the texts used has varied widely, with texts ranging from excerpts (e.g., Afflerbach, 1990b) to entire journal articles (e.g., Shearer et al., 1997); text difficulty has not typically been measured explicitly, but has been assumed to be appropriate for the expertise-related task. Individual difference variables reported have included age, years of school, years of experience in the domain, domain area of specialization, and gender, but reading ability has not often been directly assessed, and topic or domain-related prior knowledge and interest have not been routinely determined. In these studies, outcomes have not always been collected and their quality has not always been evaluated, but the types of outcomes readers have been asked to produce have included: recall, recognition, or summary (e.g., Schooler et al., 1996; Zeitz, 1994); main idea (e.g., Afflerbach, 1990b); evaluation (e.g., Neutelings & Maat 1997; Schwegler & Shamoon, 1991), literary analysis (e.g., Graves, 2001); and integrative synthesis (e.g., Wineburg, 1998).

An overview of findings related to domain experts as readers was presented in a review of studies using think-alouds during the reading of informational text (Fox, 2009). Findings from the studies were analyzed using a general framework expanding upon the C-I model of comprehension (Kintsch, 1998) that considered: whether readers appeared to be focusing their attention toward monitoring, evaluation, or comprehension; the types of processing behaviors reported, including use of comprehension-related strategies, metacognitive and monitoring behaviors, use

of prior knowledge, and goal-setting and pursuit; levels of mental representations of the text constructed by readers, specifically, textbase, situation model of text, situation model of phenomenon, and author model; and quality of those representations as manifested in products including recall, interpretation, evaluation, or application.

In general, in those think-aloud studies reviewed (Fox, 2009), readers at high levels of domain expertise were found to be different from less expert readers (where a comparison was made) and similar to each other in their attentional focus, in how they worked at understanding, in the goals they aimed at, and in their success at achieving them. Domain experts attended more readily to evaluation, and needed less attention for development and monitoring of comprehension. They moved comfortably and flexibly through the text, questioning insistently, and assessing credibility, appropriateness, and importance. They were highly purpose-driven, and generated their own goals that tended toward global-level understandings. Domain experts tended to perform excellently in terms of developing an elaborated situation model of the text, in relating that to their situation model of the phenomenon, and in constructing a representation of the text as a product of an author's choices.

The findings from studies of the reading of domain experts that did not use think-alouds (e.g., Rouet et al., 1997) or did not involve the reading of informational text (e.g., Graves, 2001) are substantially similar. All together, these findings strongly support the conclusion that the reading done by domain experts in their area of expertise is a manifestation of highly developed and content-specific reading expertise. They suggest that the expert reading of domain experts is strongly related

to their domain-related knowledge, interest, and understanding of the role of reading in the communicative interactions associated with domain-related discourse, again in close alignment with Alexander's model of reading development (2003b, 2006) and expertise development (1997, 2003a).

Reading competency. Another path for the investigation of reading maturity has been to look at degrees of reading skill. Following this line of research involves defining a more mature reader as a more proficient reader, using some measure of reading competency such as a score on a standardized comprehension test (e.g., Caron, 1989; Hartman, 1995; Langer, 1993; Martin, 1988; Olshavsky, 1976-1977; Phillips, 1988; M. Smith, 1996; VanSledright, 2002), taking greater age or length of school experience as a marker of possible greater reading competency (e.g., Afflerbach, 1990a; Bereiter & Bird, 1985; Moore & Scevak, 1997), or considering the relative contribution of each, ability and age or school experience, to reading competency (e.g., Coté, Goldman, & Saul, 1998; Drum, 1985; McMackin & Lawrence, 2001).

This notion of greater reading maturity as higher competency is generally presumed to operate across domains. It is also (where similar age or experience groups are compared) strongly associated with greater interest in reading (e.g., Guthrie & Wigfield, 2000; Rowe, 1991), although the connection of interest and competency could be explained by a number of different possible scenarios. Maturity in reading thus understood would be most closely aligned with the model of reading development formulated by Gates (1947), in which reading maturity involves flexibility and efficiency in reading different text types presenting different text

demands. It is developed as a consequence of tuning to the specialized requirements of content-area texts and reading tasks, but does not allow for the presence of the reader's own purposes in reading.

Such an operational definition of reading maturity as domain-general reading proficiency is seen in many assessments of reading comprehension and reading ability; we test students on how well they can read by giving them passages from a variety of domains, and assume that the reading ability we are interested in will be domain-general. We use such tests of reading comprehension or verbal reasoning, among other purposes, to determine preparedness for college (the SAT Reasoning Test or ACT) or graduate school (the Graduate Record Examination) or to make national (National Assessment of Educational Progress) or international (Progress in International Reading Literacy Study or Programme for International Student Assessment) comparisons.

Scores on reading comprehension or verbal reasoning tests are used to determine whether students' level of reading maturity is appropriate in relation to their grade in school, above grade-level, or below grade-level. This is typically judged in relation to both the difficulty of the passages they are given to read and the nature of the tasks they are asked to perform, with greater maturity reflected in the successful performance of higher-level tasks, such as inference, comparison, analysis, and evaluation (e.g., Bloom, Hastings, & Madaus, 1971). Vocabulary has long been known to be an important determiner of text difficulty in relation to student age, school experience, or breadth of exposure (e.g., Thorndike, 1934a-c). Unfamiliar, specialized, or technical vocabulary can present a barrier to readers' ability to derive

meaning, as well as to their motivation and their sense of inclusion as audience for the intended communicative interaction (e.g., Fox et al., 2010; Steinke, 1995; Wade, Buxton, & Kelly, 1999). Students' familiarity with, knowledge of, and interest in the domains or topics addressed by the passages read are typically not taken into account, with differences in performance assumed to be attributable primarily or exclusively to differences in reading competency (Rahman, Alexander, Mislevy, & Fox, 2011).

In studies belonging to this broad and extensive line of research, comparisons, when made, have been to less mature readers as determined by grade level, age, or ability level. In contrast to what has been typically seen in the expertise research, this research has involved not only adults but also elementary or middle-school students (e.g., McMackin & Lawrence, 2001; Moore & Scevak, 1997; VanSledright, 2002), high-school students (e.g., Afflerbach, 1990a; Hartman, 1995; Langer, 1993; Martin, 1988; Olshavsky, 1976-1977), and undergraduates (e.g., Caron, 1989; Hare, 1981). Where the nature of adult reading competence has been investigated, relatively uniform competence has often been assumed (e.g., Bereiter & Bird, 1985; Gibson & Levin, 1975; S. Smith, 1982) rather than directly measured (e.g., Caron, 1989; Hare, 1981; M. Smith, 1996).

Here again, researchers have been interested in both what more competent readers do while reading and their corresponding level of performance on some kind of outcome task. Think-alouds (e.g., Moore & Scevak, 1997; Langer, 1993), interviews (e.g., Hartman, 1995; Martin, 1988), introspective (e.g., Gibson & Levin, 1975; S. Smith, 1982) and retrospective reports (e.g., Hare, 1981) have been some of the means used for getting access to what readers are doing while they read.

Although a key characteristic of reading maturity from this standpoint would be consistency of performance (as resulting from flexible adaptability in matching reading behaviors to task demands) across a variety of text types, tasks, and reading situations, only a few studies in this line of research have so broadly explored what mature readers can do (e.g., Bereiter & Bird, 1985; Langer, 1993; Moore & Scevak, 1997). A more typical approach has been to manipulate text or task attributes in order to elicit or present the opportunity for the use of particular types of reading behaviors, for example, by systematically varying, manipulating, or otherwise controlling text difficulty (e.g., Caron, 1989), abstractness (e.g., Martin, 1988), or familiarity (e.g., Afflerbach, 1990a). A very few investigations have considered the self-chosen reading of mature readers (e.g., Gibson & Levin, 1975; S. Smith, 1982), or the role of personal reading habits in relation to reading performance (M. Smith, 1996).

Where outcome performance has been involved, types of outcomes readers have provided have included recall or recognition (e.g., Drum, 1985; Moore & Scevak, 1997), response to comprehension questions (e.g., McMackin & Lawrence, 2001), summary or report (e.g., Caron, 1989; Côté et al., 1998), and interpretation (e.g., VanSledright, 2002). Although the provided reading tasks might have invited the reader to aim at higher-level outcomes, the outcomes actually collected and evaluated in these studies have rarely involved higher-level reading activities such as critical evaluation, analysis, or comparison.

An overview of findings related to greater reading competency viewed as greater reading ability or reading experience (grade in school) was presented in the recent review of studies using think-alouds during the reading of informational text

(Fox, 2009). In general, in those studies reviewed, level of reading ability and school experience were found to be associated with readers' level of attention, with types of processing activities, and with level and quality of reading outcomes. Readers with greater ability or more school experience were able to attend to evaluation, and did not need to direct their efforts exclusively to comprehension. They appeared to engage more deeply with the texts, and were working at building integrated situation models and evaluations as well as accurate textbases. They adapted their reading behaviors appropriately for the text and task, and tended to be more effective in their use of strategies. In particular, they were seen to make relevant connections to their own prior knowledge, and made connections within the text to arrive at more global-level understandings.

Where outcomes were assessed at a level that was sensitive to effects of reading ability or experience, readers with greater ability or experience tended to be more successful in their outcome performance (Fox, 2009). However, although readers with greater ability or experience tended to look like each other, and to have consistent differences from those with less ability or experience, it also appeared to be the case that there was considerable variability in the reading behaviors observed within these groups of more competent readers, and that these varying patterns of reading behaviors tended to be associated with differences in level of processing and level and quality of outcome (e.g., Hartman, 1995).

The findings from comparably-oriented studies not using think-alouds (e.g., Hare, 1981; M. Smith, 1996) or informational text (e.g., Olshavsky, 1976-1977) are substantially similar. All together, these findings support the conclusion that

competent readers, as determined by reading achievement score, age, or level of school/reading experience, are indeed generally adaptive and efficient at on-demand reading requiring them to understand or remember text. A lingering question here is the kind of knowledge or interest that readers might have that could be supporting their competent performance in reading for learning or understanding in reading situations involving generalized content and other-directed purposes, that is, the use of reading as a cross-domain tool for often relatively low-level understanding and learning, as in Gates's (1947) view of reading development. A possible scenario related to the link between interest in reading and reading competency noted earlier is suggested by the finding by M. Smith (1996) that adults with more time spent reading and more varied text selections tended to perform better on an assessment of their prose, document, and quantitative literacy skills. A further question is what reading competence looks like in situations calling for higher-level understanding and learning (e.g., Venezky, 1991a); for example, the observation that more competent readers tended to aim at more global-level understanding suggests that they might also do well when asked to perform higher-level tasks.

Expertise and competency. Studies have also investigated how domain expertise and reading competency might interact or contribute independently to reading performance. In terms of theories of reading development, such a line of research would be positioned as investigating one of the potential complications identified as arising out of Alexander's MDL and its view of reading development within domains. In that view, there is both the highly competent reader who can read well across reading situations, and the expert reader, who reads well where she or he

has high levels of knowledge, personal interest, and familiarity with domain discourse.

For example, Voss and Silfies (1996) tested the hypothesis derived from Kintsch and van Dijk's C-I model of reading comprehension (1978) that reading comprehension skill should be associated with successful development of an accurate and coherent textbase, while level of relevant prior knowledge should be associated with success in constructing a well-integrated situation model. This distinction between reading skill and content knowledge as contributing respectively to lower-level (textbase) and higher-level (situation model) reading outcomes has been suggested elsewhere, as well: by Venezky (1991a), in his discussion of the assessment of higher order thinking and communication skills in adult literacy; by the Shanahans (2008), in their model of disciplinary literacy; and by Kintsch (1998, pp. 282-290), in discussing the relative contributions of decoding skills, language skills, and domain knowledge to good reading as seen through the lens of his C-I model of reading comprehension.

Voss and Silfies (1996) assessed their undergraduate participants' reading comprehension with a standardized test and their relative status with regard to history expertise by asking about history-related course experience and interest in history, and testing history knowledge. They found, as hypothesized, that reading comprehension skill was associated with better performance when the text explicitly spelled out causal relations, while level of relevant prior knowledge and experience with history were associated with better performance for less explicit text. They concluded that learning from text could be improved by increasing reading

comprehension skill, increasing topic knowledge, or both, but that the type of learning outcome (textbase or situation model) that would be affected would be different in each case. In addition, because Voss and Silfies (1996) saw both knowledge of history and interest in history to function similarly, they speculated that individuals in whom the two are associated may have developed a disposition to approach history texts in a certain, domain-specific way.

The development of an interest-driven approach to text in relation to expertise and reading competency was investigated by Fink (1998), who explored how highly successful adults had achieved high literacy levels despite having dyslexia. Participants were determined to have dyslexia if they had been so diagnosed as young readers, or, for older participants, if they self-reported a case history of early reading difficulties. Participants included adults from a variety of professions, many of which involved extensive reading. They were interviewed about their reading history, and also completed a battery of formal and informal literacy assessments to determine their current reading skill profile; results were compared to a pool of non-dyslexic peers.

Fink (1998) found that overall, the dyslexic participants continued to lag behind non-dyslexic peers on the literacy measures used, and tended to do less reading outside of work. The findings from the interview data confirmed a hypothesized model of the role of personal interests with regard to the development of the ability to read for meaning, in this case despite having difficulty with more basic, word-level processes. The four elements of the model were: "1. passionate personal interest in a content area requiring reading; 2. avid, highly focused reading;

3. deep schema knowledge; and 4. contextual strategies" (p. 336). These findings suggest, as already seen in the expert reading research, that strong content interest and deep content knowledge support reading for higher-level meaning, with the further extension that they can do so even where more basic reading skills are deficient.

The specific joint and independent roles of interest and knowledge in learning from text were considered by Schiefele (1999). His overview of the relevant research found mixed support for the hypothesis that level of personal interest in the domain would be associated more with deep-level than surface-level learning.

On the one hand, there is positive evidence that interested readers represent the meaning of text to a greater extent than less interested readers, and less interested readers are more inclined to process and store verbatim text features than interested learners. On the other hand, interest did not have any impact on the situational representations, that is, the deepest level of learning. This suggests that motivational effects on learning may have certain limits.

Beyond these limits, learning may depend to a greater extent on ability factors than on motivation. (p. 269)

Schiefele went on to examine the evidence as to the independent effects of interest, prior knowledge, and reading or verbal ability on learning from text. He concluded that strong knowledge effects were only likely to be seen when the text difficulty was such that prior knowledge would be necessary for effective learning, and when there were large knowledge differences among participants, as in expert-novice studies. He also concluded that knowledge and interest were most likely to show separate effects when readers were at an early stage of development with regard to learning in a

particular domain. Schiefele found, on the basis of the research conducted thus far, that cognitive or reading ability was likely to be strongly related to the construction of a situation model while personal interest appeared to be most strongly associated with the development of a textbase, a finding that has not been well supported by other research based on the C-I model, such as that of Voss and Silfies (1996). Overall, these results suggested to Schiefele (1999) "that cognitive and motivational factors may have different effects on different components or processes of text learning" (p. 272).

The roles of domain expertise, reading ability, domain and topic knowledge, and personal interest in the domain were investigated in a cross-domain, cross-sectional MDL-based study of reading expertise (Fox et al., 2005). Participants were domain experts for the domains of reading and history, highly gifted young readers, and undergraduates as participants. They thought aloud while they read challenging, college-level argumentative texts in reading and in history, and were assessed on both high- and low-level reading outcomes, as well as for domain- and topic-specific knowledge and for levels of personal interest for each domain. In this case study approach, expertise, ability, knowledge, and interest appeared to interact as predicted by the MDL, with experts reading expertly in their own domains, but also to have distinguishable roles for non-expert reading, including the reading of experts outside their own domain.

In a set of follow-up studies with expert (Fox, Maggioni et al., 2008), highly gifted (Fox & Dinsmore, 2009; Fox et al., 2010) and undergraduate (Fox, Alexander, & Dinsmore, 2007; Fox, Dinsmore, Maggioni, & Alexander, 2008; Fox et al., 2009)

participants, the separate influences of expertise, reading ability, relevant domain knowledge, and interest in the domain and reading topic were further observed. In particular, the work with undergraduates led to the identification of distinct reading profiles related to high reading competence, knowledge-reliance, and interest-reliance, where knowledge-reliant or interest-reliant readers engaged more actively and effectively in reading texts for which they had high prior knowledge or stronger interest in the domain or topic addressed, while highly competent readers could read effectively even where they were low on knowledge and/or interest.

One overall conclusion to be drawn from this body of work by Fox and colleagues was that readers appear to bring with them a tendency to approach text in a certain way, which can be hypothesized to be related to their understanding of what reading is supposed to look like; this tendency can be domain-specific or domain-general, tuned to the presence of likely links to their own knowledge or interests or to the more general possibility of learning. Readers' success in understanding the text at a local or global level, in learning from the text, and in being positioned to evaluate the text appears to result from the interaction of this initial tendency and the specific factors of the reading situation, with less competent readers being more dependent on the supportiveness of the reading situation in the way of relation to pre-existing knowledge, evocation of interest, and difficulty of the text.

Readers' approach to text and its relation to their view of the purpose of reading was discussed in relation to the MDL in a chapter on higher-order thinking by Alexander and colleagues (Alexander et al., 2011), with a proposed distinction being made between readers who view text as a vehicle for the presentation of content-

related information, and those who view text as a communication from an author. It was suggested there that the latter view is more adaptive for the type of cross-situational performance hypothesized for proficient readers, while the former is compatible with the excellent domain-specific reading of domain experts. Both types of readers can be seen to be aware of the presence of an author, to be aiming at integration of the text with what they already know, and to be looking for broader patterns and understandings, but these aspects of their reading originate in a fundamentally different approach to reading, or epistemic orientation toward reading.

Reading approach. The third path for investigation of reading maturity to be considered here is that in which reading maturity is viewed as related to a more sophisticated, knowledge-building, meaning-oriented or critical approach to text. Following this line of research involves defining a mature reader as a more epistemically sophisticated reader, using some typically domain-general gauge of sophistication such as approach to reading or learning (e.g., Marton & Säljö, 1997; Säljö, 1997), implicit model of reading (e.g., Schraw & Bruning, 1996, 1999), epistemic beliefs (e.g., Perry, 1959, 1970, 1981), or rhetorical stance (e.g., Haas & Flower, 1988). Maturity in reading thus understood would be most closely aligned with Chall's (1983) model of reading development, in which the transition between reading stages involves reconceptualization of the nature of reading, which then dictates the shape of the reading purposes addressed and reading behaviors enacted in that new stage.

This line of research has sought first to establish the empirical validity of the idea that the reader's approach matters in reading and learning from text, and that

approach might be something readers bring with them to the reading situation. A further consideration has been to look for the relation of approach to what is produced in the way of reading behaviors and outcomes, and then also to investigate how to push students toward a more adaptive or mature approach (e.g., Marton & Booth, 1997; Marton & Säljö, 1997; Säljö, 1997). Such research has tended to be pursued with students of college age or above. Studies have used interviews (e.g., Marton & Säljö, 1997; Säljö, 1997; Perry, 1970, 1981), questionnaires (e.g., Perry, 1970, 1981; Schraw & Bruning, 1996, 1999), and structured tasks (e.g., Perry, 1959) to get at readers' approaches to reading or belief sets about reading or about learning. Data on what participants did while reading were collected via think-alouds (e.g., Haas & Flower, 1988) or interviews (e.g., Marton & Säljö, 1997; Säljö, 1997), and data on what readers arrived at in the way of a learning outcome were also typically gathered (e.g., Marton & Säljö, 1997; Perry, 1959, 1970, 1981; Säljö, 1997; Schraw & Bruning, 1996, 1999).

The work by Perry (1959, 1970, 1981) originated in a remedial reading class intended to help undergraduates cope with the demands of college-level reading at Harvard. Perry (1959) found that these students were hindered in their ability to read for meaning by what he termed an "obedient purposelessness" (p. 197); they appeared to conceive their task in reading to be one of reading every word in order to be told what the text was saying, although in other respects they were excellent readers, scoring very highly on standardized tests of reading comprehension and showing remarkable ability to recall what they had read.

Perry (1970, 1981) went on to study undergraduates' epistemic beliefs more generally, doing longitudinal questionnaire- and interview-based work, in which the topic of reading and beliefs about reading emerged as a strongly salient theme, although it was not treated separately. He found that students had relatively coherent systems of epistemic beliefs, and moved in a relatively orderly developmental progression during their undergraduate experience, from a possible initial state of dualism, through multiplicity, relativism, and then possibly into commitment. He determined that epistemic beliefs had a profound effect on what and how students learn.

These structurings of meaning, which students revise in an orderly sequence from the relatively simple to the more complex, determine more than your students' perception of you as teacher; they shape the students' ways of learning and color their motives for engagement and disengagement in the whole educational enterprise. (1981, p. 77)

As with his earlier work, Perry (1970, 1981) found that students' beliefs about learning were strongly connected to the idea of agency and their own role in the learning process. With regard to reading in particular, students at earlier stages of epistemic development tended to see their job in reading as attending to learning, where learning meant a direct and passive taking in of the information presented in the text; a more adaptive and successful approach to reading in which they had some responsibility for engaging with the material, for considering the author and the author's purpose, or for evaluating and weighing the merits of content, selecting and constructing their own justified opinion, came with later epistemic development.

Ways of reading were often integrally embedded in assumptions about purpose, authority, and morals. Students who read word-by-word often told us that our recommendation to "look ahead" was commending to them a form of "cheating" in which they refused to participate. We found that these students had invested their courage in "concentrating" (that is, *not thinking* of other things) for long hours, and we could not help them to concentrate *on* thinking about what an author was saying until they could reinvest their courage in risks of judgment. (emphasis in the original, 1981, p. 104)

Students' divergent views of agency in reading also emerged in the work by Schraw and Bruning (1996, 1999). Schraw and Bruning developed a questionnaire assessing beliefs about the role of the reader, and found two basic and independently functioning stances in their undergraduate participants, one viewing the reader as passive and the reading process as one of transmission, and the other seeing the reader as actively engaged in construction of meaning, and the reading process as one of transaction with an author. When they related these stances to performance in reading an 800-word text representative of typical everyday reading (1996), they found that strength of transaction beliefs was related to better recall and greater number of critical and personal responses to text, while strength of transmission beliefs was related to poorer recall, and reduced or negative response for all aspects of the reading experience.

Schraw and Bruning (1999) went on to claim that transaction beliefs are essential for successful reading, and that they are associated with depth of engagement and understanding, with the development of a more global or holistic

interpretation of the text (which they identified with Kintsch's situation model), and with a consciousness of and critical stance toward the text as presenting an author's message. They made the strong claim that transaction beliefs operate in this way regardless of text type, and "should be promoted whenever possible, regardless of the setting" (p. 298). They speculated that "most readers adopt transaction beliefs late in their academic careers, and then only after major intellectual upheaval" (p. 299). Transmission beliefs appeared to play little role in adult reading, however.

The degree to which readers are oriented toward an understanding of reading as a constructive, participatory discourse act was also investigated by Haas and Flower (1988). They framed this view of reading in terms of rhetorical reading, meaning reading that was directed toward understanding the author's purpose and how the author had structured the text to go after that purpose. Rhetorical reading would therefore also support an awareness of how other readers might respond to the same text. The description by Haas and Flower of the specific type of reading difficulty produced by failure to engage in rhetorical reading resembled the consequences of less adaptive forms of beliefs about learning or reading as portrayed by Schraw and Bruning (1996, 1999) and by Perry (1959, 1970, 1981).

Many of our students are "good" readers in the traditional sense: they have large vocabularies, read quickly, are able to do well at comprehension tasks involving recall of content. They can identify topic sentences, introductions and conclusions, generalizations, and supporting details. Yet these same students often frustrate us, as they paraphrase rather than analyze, summarize rather than criticize texts. (Haas & Flower, 1988, p. 170)

When they compared college freshmen and graduate students given the same decontextualized reading task, Haas and Flower (1988) found that the younger readers tended to read at a gist level and mainly paraphrased the text, while the more experienced readers considered the author and how the author was going about presenting the message, which enabled them to detect both explicit and implicit important claims being made. Only the more experienced readers behaved in ways suggesting rhetorical reading, and all of them did so, even though the text did not pertain to their academic areas of expertise.

The focus in the research on approach to learning (Marton & Säljö, 1997; Säljö, 1997) was on the learners' experience of the learning situation. This line of research used a phenomenographic methodology, in which participants are given a common task, outcomes are collected, their perceptions of the learning experience are gathered by means of interviews, and those perceptions are analyzed to create a systematic hierarchy of responses in a response space, the categories of which are then related to the levels of outcomes observed.

By means of this methodology, Marton and Säljö (1997) identified what they termed deep and surface approaches to learning or to reading, which they arrived at by noticing that students appeared to differ in the actual processes of learning engaged in during the same reading situation, in ways that were not related to differences in prior knowledge or to text difficulty. Students adopting a deep approach tended to consider what the text meant, to aim at understanding its message, to relate it to what they already knew, and to relate the parts of the text to itself and its meaning to its structure. Students adopting a surface approach tended to aim at the

words of the text and to strive for memorization. The deep approach tended to go with more successful learning, and also with greater desire to learn. "Learning or reading out of interest, a wish to find something out (i.e., due to intrinsic motivation), can reasonably be expected to be linked with a deep approach" (p. 53). Marton and Säljö also found that greater school experience tended to be associated with greater likelihood of adopting a deep approach.

Säljö (1997) considered the role of deep and surface approaches in different types of reading situations, particularly in school-related reading versus everyday reading. He contrasted the natural desire to understand the message of a text when reading for everyday purposes with the somewhat decontextualized or abstract situation in which the text is assumed to be presenting something to learn. The deficiencies of the surface approach relate to the reader's focus on learning the text rather than treating it as a message; Säljö characterized this as an imbalance in the roles assumed by the reader and the writer in the communicative text-based interaction of reading. When the reader aims to learn the text content, the idea of the text as presenting an author's message is overridden, and the reader sets the terms for the sense-making process in relation to his or her own understanding of what is going on: the extraction of information. A deep approach to learning from text therefore represents the ability to carry over the understanding of reading operative in everyday reading into the more abstract and decontextualized world of academic reading.

Reading is characterized by a *voluntary and self-induced desire to attend to a written discourse in which there is a genuine and momentary desire to find out what is 'made known'*. A basic feature of a deep approach therefore seems

to be that this attitude is also maintained in a situation where there may not be such an initial commitment on the part of the reader, but where the reading is undertaken in response to a request or requirement. (p. 103, emphasis in the original)

However, why readers come to the reading situation with these different approaches is not clear. It appears that educational experience could strongly influence how readers interpret the learning situations presented (Marton & Säljö, 1997), with most school experience at the undergraduate level or below in general fostering a more surface or task-oriented approach. Shifting readers to a deeper approach by means of some type of instructional intervention appears to be extremely difficult (see also Haas & Flower, 1988; Perry, 1959, 1970, 1981), and how readers could arrive at such an approach on their own is somewhat of a mystery (Marton & Booth, 1997).

The fundamental questions addressed overall in this line of research on maturity as related to the reader's understanding of the purpose of reading are: first, whether readers have relatively coherent or systematic beliefs about the purpose or meaning of reading that can be arranged into some kind of developmental sequence; second, whether these beliefs are then carried through into consistent patterns of action during reading and outcomes in the way of reading performance; and third, what situational factors appear to relate to how strongly beliefs and action patterns are linked. The answer to the first and second questions has been a strong affirmative, with caveats related to the response to the third (e.g., Schraw & Bruning, 1999, Säljö, 1997), in that the type of reading task set and the level of difficulty of the text can

mask the effects of approach, by either eliciting a surface-level, transmission, or otherwise shallow approach or measuring performance on a level that does not capture possible differences in approach.

A further question has been with regard to the type of person who tends to have one approach or another. A general tendency observed has been that with greater college-level or graduate school experience, readers shift to a more sophisticated view of reading, which is attributed to volume and type of reading (Marton & Säljö, 1997), to some kind of transformational experience related to greater experience with academic reading (e.g., Schraw & Bruning, 1999), or to both (e.g., Perry, 1970, 1981). This type of experience-related developmental shift in the reader's view of reading is in line with Chall's theory of reading development; however, there is also some evidence to suggest that younger students can read in ways that might position them more readily to read in this way, with regard to agency (e.g., self-directed learners, Miechenbaum & Biemiller, 1992) and also with regard to a meaning-oriented approach to text (e.g., Bereiter & Scardamalia, 1993; Brown & Campione, 1990; Brown et al., 1981). The question therefore remains as to how younger readers or readers who arrive in college with a deeper or more sophisticated approach might have developed such an approach.

Yet another question regards how a domain-general approach might arise with increasing college-level experience. Chall (1983) hypothesized that a deeper approach would relate to specialization, participation in domain discourse, and greater content-area knowledge, and that reading at her Stage 5 would relate specifically to a particular domain of expertise. Could such a focused change in the view of the

purpose of reading, as related to the reading done in an area of academic specialization, also promote some kind of transfer resulting in a more general adjustment in the view of the purpose of reading, as suggested by Pressley and Afflerbach (1995)? Is there a general shift to a more meaning-oriented view of reading, or an acknowledgement of both content and rhetorical space as present in all texts and all reading (e.g., Geisler, 1994; Haas & Flower, 1988)?

In light of the discussion of everyday and school reading by Säljö (1997), an interesting avenue for exploring the genesis of a reader's more mature approach to reading might be to investigate how the reading done outside of school might relate as well to the general approach taken to reading. There is some evidence that reading habits relate to reading competency, success in performing reading tasks, and possibly also to depth of approach to the text (e.g., Fox, 2010; M. Smith, 1996). In the study by Fox (2010), independent reading habits, specifically the reading of books outside of coursework, were seen to be related to both level of success in identifying the important points of a passage from a course textbook, and reading behaviors during reading as captured by think-alouds. More successful performance and more active and meaning-focused reading were seen from male undergraduates who reported reading books, as compared to male undergraduates who reported reading only other types of texts, such as newspapers, magazines, or online material. In this study, reading habits appeared to matter and to relate to approach to reading, even when levels of relevant prior knowledge and interest were considered. M. Smith (1996) went so far as to identify maturity in reading specifically with adult reading

habits and the choices of what to read, although the directionality of any causal relation was not clear.

The essential nature of expertise in reading may not lie so much in comprehension of what is read (although understanding is important), but rather in the kinds of decisions the reader makes about what and when to read, and how to do so, in order to meet a diversity of demands. Such behaviors are also likely to result in higher literacy abilities, greater reading maturity, and increased levels of readership among adults. (p. 218)

Reading as a behavior. The final investigation of maturity in reading to be considered is that of Gray and Rogers (1956). The notion of maturity in reading adopted by Gray and Rogers bridges over both the idea of reading competency and that of approach to reading, but it does not incorporate reading expertise. Because Gray and Rogers were interested in reading maturity as it might be evident in the general population of adults and with regard to reading viewed as a behavior, they began from a perspective on reading as occurring in all contexts of life, rather than beginning from a view of reading as a strictly academic endeavor. From their consideration of current ideas on general development and reading development, Gray and Rogers developed a set of seven characteristics of the mature reader (presented earlier) related to aspects including competence, habits, attitudes, interests, and perspectives. As discussed earlier, the conceptualization of reading maturity behind this research is essentially connected to the potential for growth and self-development.

On the basis of a set of preliminary interview-based case studies using cross-sectional samples of adults, Gray and Rogers (1956) developed their final instrument and methodology for assessing reading maturity. From the recommendations of reading specialists and their case study data, they created 16 extremely detailed scales assessing criteria for reading maturity, with five possible maturity levels developed for each item on each scale. These maturity levels were in some cases defined quantitatively, while in other cases they were more descriptively discriminated. These scales related to: interest in reading; purposes for reading; reading competence with regard to recognition and construction of meaning and also with regard to reaction to and use of ideas apprehended; and material read (p. 76). They used these scales to re-analyze their cross-sectional interview data, as well as interview data from a selected group of putatively mature adult readers, and again used a case study approach to develop individual reading profiles. Gray and Rogers found it necessary to tighten their focus to a selected group of more mature readers due to the failure of their broader cross-sectional sample of adults to provide data that supported the adequate distinction of characteristics of mature reading.

The methodology used by Gray and Rogers (1956) with the selected group included an in-depth interview in which readers provided information on: their background as a reader with regard to home, school, academic training, and work; their reading interests, including topics of interest, types of material read, and depth of interest; their current reading and the purpose for reading each title; their current amount of voluntary reading, their enthusiasm for reading and how important reading was for them in various aspects of life. They completed an assigned reading, a brief

newspaper article, and were asked to summarize it from memory, and then to respond to questions about its reliability, the presence of author bias, their own connection of the content to prior knowledge or related ideas, its possible significance, how it fit with their own ideas on the topic, and possible uses they could make of the material in it.

Essential elements of their overall findings have been presented earlier, but a few are worth reemphasizing here, in connection to the general discussion of investigations of reading maturity. Gray and Rogers (1956) found that reading maturity was extremely rare, that enthusiasm for reading was strongly related to other aspects of maturity, that maturity in reading was associated with both high accuracy and depth of understanding, and that it was not necessarily related to amount of education; although amount of education did tend to be associated with general competence at reading, it was not linked to interests and reading habits that would support personal development. Two other important conclusions were related to individual differences.

The first is that each adult reader is distinctive, in the sense that he represents a combination of reading interests, attitudes, and skills that is rarely duplicated in full by others. The second is that these diverse patterns of reading behavior are the product of the varying external factors and personal characteristics that influence the development of each reader. (p. 230)

In reflecting on the procedures they had adopted and the evolution of these procedures over the course of the larger research enterprise, Gray and Rogers (1956) concluded that the case study approach based on a combination of interview and

performance task provided valuable, rich, and important data related to reading maturity. They felt that the step of developing explicit and somewhat objective standards by which to assess levels of reading maturity in relation to their criteria was a critical one, but that the initial tuning of these standards to the affordances of the data they were to be used to analyze was necessary. However, when the actual use made of their scale scores is considered, it appears that a good deal of weighing, balancing, and subjective interpretation was called for in order to arrive at an understanding of the meaning of an overall profile of reading maturity in relation to these sixteen scores, with difficulties at both the level of the individual considered in isolation and in determining what one individual's profile might indicate with regard to relative maturity compared to that of another.

Building Upon the Literature

The purpose of this review has been to consider how to conceptualize and investigate maturity in reading. The initial step involved getting a sense of what is at stake in connection with the perspective on reading adopted. The next move was to a discussion of theories of reading development within which different approaches to reading maturity derive their meaning. Narrowing the focus somewhat, the final steps were to map out and travel along the various conceptual and methodological paths by which investigations into reading maturity have proceeded, and to flesh out the empirical side of the view of reading maturity by considering the contributions of their findings and issues or questions raised.

Perspective on Reading

This study of reading maturity is informed by the perspective on reading adopted in taking reading as a behavior; that is, a purposeful activity engaged in regularly as part of going about the business of living, and as developing across the lifespan. This view implies that becoming a mature reader does not mean having finished developing as a reader, and that reading maturity includes the potential for continued capacity for development. This study takes into account the complexity of reading as involved layering of multiple systems, including cognition and motivation, and their dynamic interaction over time and during a given set of reading events. It also embraces the messiness of reading, which calls for a willingness to be provisional, to be open to complication, and to resist the impulse to over-simplify or prematurely tidy things up in developing understandings or explanations. It foregrounds reading as communicative, with the need for the reader to be collaborative and interpretive, and the opportunity for the reader to be evaluative. The perspective on reading adopted further informs the current study of reading maturity in requiring the acknowledgment that reading is contextually anchored with regard to multiple aspects of its setting, including the place, the time, and the individual difference and situational variables considered as important. The construction by the reader of a context for the reading act and for the text as an author's creation are also necessary to consider.

Taking reading as a behavior, as in the perspective adopted, means seeing it as purposeful. The current study considers the aspects of purposefulness identified as belonging to reading as a behavior, including the role of multiple forms or objects of

interest for the reader: interest in reading (including the choice to read and of what to read); interest in learning; interest in a particular text, and interest in use of what is learned or derived from text. The reader's epistemic orientation is also considered, with regard to agency, to the collaborative, interpretive and evaluative nature of reading as a communicative interaction, and with regard to the reader's focus or intended object of knowledge when reading. The other aspects of purposefulness considered in this study are the reader's identity as a reader, and the types of goals the reader pursues by means of and during reading.

The final aspect of the perspective on reading that informs this study is the transformative power of reading. Reading is seen to be both dependent on prior experience and generative of the experience that can support future learning activities. It involves both assimilation and accommodation, and can serve as a means for accumulating knowledge and as a form of self-development.

Theories of Reading Development

The discussion of theories of reading development approached these theories through five questions related to the perspective on reading adopted: the aspects of reading addressed, the mechanisms of growth as a reader, the types of environmental interactions supporting growth, the relation of growth as a reader to growth as a learner and growth as an individual, and the ultimate aim of reading development. The theorists involved were Gates (1947), Gray (1925a, 1937; Gray & Rogers, 1956), Gibson and Levin (1975), Chall (1983), and Alexander (1997, 2003a, 2003b, 2006). Cross-theory comparisons (overviewed in Table 1) generated a number of relevant

issues, questions, and suggestions for this study of reading maturity; they will be summarized briefly here.

The selection of graduate students as the participants to use in revisiting Gray and Rogers's (1956) study of maturity in reading arose from consideration of the importance of allowing for a role for general maturity, for school experience, and for depth of content-area learning in investigating maturity in reading. A key issue that emerged from the cross-theory comparison with regard to aspects of reading addressed was the context of reading development as within school or as extending beyond the boundaries of the academy; a related issue is the importance of content-area knowledge, interest, and expertise as entailed in the manifestation of reading maturity. The grounding of this study in Gray's theory of reading development and as a re-visitation of his investigation with Rogers of reading maturity were also supported by this cross-theory comparison.

Consideration of mechanisms of growth in reading development for the different theories revealed that this study needs to consider what the reader might have in the way of knowledge and interest related to reading, related to the specific content-area involved in a given reading situation, and related more generally to an area of content-area expertise. A further issue was the specificity or generality of the reader's epistemic orientation, and the extent to which reading is viewed as a communicative interaction. In line with Gray's theory, it also is also important to inquire about reading attitudes and habits, reading interests, and breadth and depth of reading experiences, including possible formative experiences related to a sensitivity to reading as communicative.

Finally, the cross-theory comparisons with regard to development as a learner, as a reader, and as an individual suggested the importance for the study of reading maturity of inquiring about readers' own views of the interconnection of reading, learning, and development. Views of the ultimate aim of reading that must be taken into account in investigating reading maturity include the instrumental or professional role of reading for high-level academic knowledge construction and also the personal or amateur engagement in reading as a path for self-development and fulfillment.

Conceptualizations and Investigations of Reading Maturity

The cycling and interconnection of the themes and issues proving to be salient for the investigation of reading maturity were further evident with the consideration of how reading maturity has been conceptualized and investigated. Repeated issues included the importance of a view of reading as a communicative interaction nested in a particular discourse situation, and of the very different views of reading maturity arising from reading as viewed primarily in an academic or a personal context. The contributions of knowledge and interest to excellence in reading performance, and the types of knowledge and interest that could matter were again identified as important for conceptualizing, operationalizing, and evaluating reading maturity. Connected to this was the additional issue of the place of cross-situational consistency in understandings of reading maturity, an issue not directly addressed by Gray and Rogers (1956) in their study of reading maturity. The association of the degree and depth of the reader's active interaction with the text in deriving meaning and the reader's performance in relation to some level of outcome task also emerged as salient; further, the nature of the reader's interaction was seen to be linked with the

reader's view of the purpose of reading and of what was supposed to go on in reading and learning.

Important methodological concerns arising in conjunction with these findings were: the need to inquire about readers' reading habits, reading interests, views of the purpose of reading in general and in this situation, and view of themselves as readers; the need to collect some evidence of what the reader is doing while reading; and the need to ensure that the reading task and any outcomes assessed are of adequate depth and sensitivity to capture effects of differences in the reader's approach.

This study of reading maturity addresses a pair of conjoined research questions regarding higher-level reading development:

What do *maturity in reading* and *competence in reading* from the perspective of Gray's theory of reading development look like when the additional aspects of readers' behaviors during reading, readers' understandings of reading, readers' perceptions of themselves as readers, and readers' performance under conditions of varying levels of topic knowledge and topic interest are incorporated into their descriptions?

The current study re-visits Gray and Rogers's investigation of reading maturity, using graduate student participants. Participants were interviewed as to their reading background with regard to both in-school and out-of-school reading, their current reading habits, their understandings of reading, their views of themselves as readers, and their knowledge of and interest in reading. They engaged in a reading task in which they were asked to read difficult and unfamiliar texts for which they had varying levels of topic knowledge and interest, and to think aloud while they

read. They responded to open-ended questions assessing their ability to recognize important ideas, what they learned from reading the text, their evaluation of the text's reliability, and their evaluation of the presentation of the text. Finally, they were re-interviewed regarding their perceptions of their reading experience.

From these data, a view of reading maturity and its possible precursor or alternative developmental endpoint of reading competence was developed. This view expands upon the work of Gray and Rogers in collecting think-aloud data enabling the observation of the reader's behaviors during reading, in considering cross-situational consistency, in addressing factors such as reading approach, knowledge, and interest that have been identified as important in more recent research related to reading maturity, and in directly considering the possible developmental role of both school-related and personal reading experience. The portraits of reading maturity and reading competence that are generated in the case study approach used have the potential to untangle a number of confusions evident in the theories of reading development and investigations of reading maturity. The understanding of reading maturity is at the core of the enterprise of enabling, encouraging, and educating children to read, and it is very important to be clear on what is at stake.

CHAPTER III

METHODOLOGY

This chapter presents the methods adopted in conducting the study. It first describes the purpose of and participants in the pilot study conducted as preparation for carrying out the study. The modifications to measures and procedures as a result of findings of the pilot study are discussed. Then I describe the participants in the study itself and the measures used for data collection, and address how the specific choices made support the collective case study design that is undertaken here, as both a re-visitation of and expansion upon the study of reading maturity by Gray and Rogers (1956). Finally, the procedures used to collect the data are outlined.

The Pilot Study

Purpose

Before collecting data for this study, I conducted a pilot study with a small sample of comparable participants. The pilot had three purposes. First, I wished to determine the amount of time participants required to complete the measures for each of the two sessions, and whether participants would lose interest or become too fatigued in completing the reading task and other assessments. Second, I wanted to determine the appropriateness of the measures and, more specifically, whether adjustments were necessary to directions and individual items for them to function as I intended. Third, I wanted to find out whether participants felt the interview questions, the profile selection task, and the reading task were valid means of getting at their own ideas, self-perceptions, and experiences of reading and called upon them to demonstrate their reading competence.

Participants

Five graduate students participated in the pilot, all female. Four were graduate students in human development, and one in astrophysics. All were pursuing PhDs. Their ages ranged from 21 to 34; four identified themselves as non-Hispanic White and one as White/Hispanic. One of them had first learned to read in a language other than English (Italian). This set of participants was thought to be reasonably comparable to the expected sample in the full study as a sample of graduate students per se, although there were expected to be male participants as well, and a somewhat more diverse range of areas of specialization.

Measures and Procedure

The measures administered to graduate students in the pilot study were essentially similar to measures that were used in the full study, with the exception that the profile selection component of the structured interview was replaced by direct questions about self-perception as a reader. Participants were invited to comment on the measures and procedure as they went along and also at the end of each session. A brief description of measure and procedure changes based on data and feedback from the pilot study is provided here.

During the first pilot session, participants completed a demographic information sheet and then participated in a structured interview about their reading history, reading experiences, current reading habits, and views of reading. Next they were asked to read a set of 12 brief reading profiles describing possible competent or mature adult readers, and asked to select the one that fit them the best. The final task in the first session was for participants to complete the knowledge and interest

evaluation. They were asked to identify their likely level of knowledge for, and interest in reading an entry in the first edition of the *Encyclopedia Britannica* (Smellie, 1768-1771/1979), based on its first sentence. They were given a set of 30 possible entry topics and first sentences, and asked to rate their likely knowledge and interest as: high knowledge, high interest (HK-HI); high knowledge, low interest (HK-LI); low knowledge, high interest (LK-HI); low knowledge, low interest (LK-LI). After this rating task was completed, participants were asked to look back at their ratings, and pick out an exemplar of each of the four knowledge/interest categories. The purpose of this rating and selection process was to inform the choice of passages to be read in the second session.

The pilot and modified versions of the structured interview are given in Appendix B, and the profile selection task (used only in the pilot) is given in Appendix C. The knowledge and interest evaluation measure is given in Appendix D. All other measures provided in appendices are the modified versions that were used in the full study.

Modifications to the measures and procedures for the first session based on feedback from the participants included adding a question about number of years of graduate study to the demographics questionnaire. In the knowledge and interest evaluation, some modifications were made to increase the likelihood that participants would have a relatively clear idea of what the passages would be like, so that their evaluations of projected knowledge and interest would be reasonably well-grounded. The citation for the *Encyclopedia Britannica* was changed to give only the original date, rather than both the original date and the date of re-publication. This was done

so that participants would more clearly register that this was a very old set of encyclopedia entries. I decided to give participants an entire sample entry to read as well, prior to their completion of the evaluation task, so that they could get a flavor of what a complete entry would be like. A sample entry on Hell was selected to serve this purpose, as being exemplary of the content, style, and length of the encyclopedia entries to be read. This sample entry on Hell is given in Appendix E. The amount of text presented for each entry was modified to include 85-95 words of the beginning of each entry, rather than the first sentence. This was done because the lengths of the first sentences varied considerably, so that participants were getting significantly more information about what some entries would be like, and significantly less about others.

The profile selection task was considered to provide too difficult a data-analytic situation, and was replaced in the full study by direct questions added to the structured interview, asking readers to discuss their self-perceptions as readers (questions 13-17 in the modified version used in the full study, given in Appendix B).

In order to accommodate the extra time required for reading the sample entry and for reading the more extended beginnings of each entry in the rating task, the number of items was reduced to 27. This was accomplished by eliminating two entries that seemed problematic due to their more unfamiliar vocabulary (Opium) and somewhat different structure (Pearl), and by removing the entry on Funeral Rites so that it could function as the practice think-aloud passage for all participants. The instructions for the task were modified to reflect both of these changes.

In the second session, participants began by completing the knowledge pre-assessments for all four entries to be read. This pre-assessment asks the participant to read the beginning of the entry (as was presented in the knowledge and interest evaluation), and then to give up to five points expected to be discussed in the entry. The template for the knowledge pre-assessment is given in Appendix F.

Modifications to this measure included changing the instructions to give only the original date of publication of the *Encyclopedia Britannica* and to reflect the inclusion of a beginning portion of the entry rather than the first sentence. The standardization of the amount of material presented from each entry was intended to help to prevent unintended differences in how well participants would be able to project what will be in the entry due to the amount of information provided in the prompt. The procedure was also changed to have participants complete all of the pre-assessments prior to reading any passages. For the first participant, the knowledge pre-assessment was completed immediately prior to reading each passage; this proved to add to the fatigue level, and also to present the possibility of an effect from exposure to the previous passages as far as improving ability to project the type of information likely to be presented in such entries.

Next, participants were given instructions in thinking-aloud (Appendix G), and practiced thinking aloud with the passage on Funeral Rites (Appendix G). They read and thought aloud for the first passage, and then completed the four tasks on the post-reading assessment, the template for which is given in Appendix H.

When they were finished with the post-assessment, they moved on to the next passage and repeated this thinking-aloud and post-assessment task procedure. The

passages corresponded to the topics that had been selected as exemplars for each category in the knowledge and interest evaluation in the first session. They were presented in the following order: LK-HI; LK-LI; HK-LI; HK-HI. The entire pool of 27 passages is given in Appendix I. Modifications to the passages based on the pilot included changing the reference so that only the original date of publication, place of publication and publishers are given, again to reinforce participants' awareness of the entries as from an old text. The other modification was the removal of the passages on Opium, Pearl, and Funeral Rites, as noted.

The last activity was the post-reading interview. The questions for this are given in Appendix J. The entire second session took between 90 minutes and 180 minutes for these participants, with differences due to amount of time spent on the pre- and post-assessments.

The Study

Design

This study follows the design used by Gray and Rogers (1956), in which multiple cases were used to develop a descriptive understanding of a larger phenomenon. In this situation, the cases are used instrumentally (Stake, 2006), in that the focus is not on the individual case but rather on what it illustrates about the larger phenomenon being investigated. This type of approach to qualitative, descriptive research is known as a collective case study (Barone, 2004), a multicase study (Stake, 2006), or a multiple case study (Yin, 2009).

Here the label of "collective case study" will be used, because it suggests the blending of particular cases into a collective description that is aimed at in this study.

A collective case study is a particular mode of case study research involving the qualitative, descriptive investigation of an overarching and bounded phenomenon through the observation and comparison of multiple relevant cases (Barone, 2004). A collective case study is an appropriate methodology where what is sought is an understanding of an underlying "phenomenon, group, condition, or event" (Barone, 2004, p. 9) that is built up inductively by consideration of multiple cases and multiple types of data sources. It produces an elaborated description developed by consideration of the patterns observed, in which the identification of relevant patterns is informed and guided by the researcher's theoretical framework (Yin, 2009). It thus resembles but is distinct from phenomenologically oriented qualitative research in which participants' accounts of their experiences are the exclusive or primary focus (Creswell, 1998; Schram, 2003), and from grounded theory in which the aim is the development of a theory (Creswell, 1998; Schram, 2003).

There are a number of ways of balancing out the emphasis on the specifics of the particular cases and on the unifying, overarching phenomenon that creates the rationale for the selection of cases (Stake, 2006). Here the procedure takes the path followed by Gray and Rogers (1956), in which the individual cases support the development of more formalized profiles that facilitate cross-case comparison (Stake, 2006). The cross-case comparison then forms the basis for pattern detection related to the overarching phenomenon; these patterns are then elaborated, articulated, and validated by mapping back onto the specifics of some or all of the individual cases (Stake, 2006). The resulting description of the overarching phenomenon incorporates both the findings from the cross-case comparison and the insights obtained from their

reflection back onto the individual cases, as was done in Gray and Rogers's (1956) study of selected cases.

This type of approach seeks to respect the complexity of the phenomenon investigated, and it allows the researcher to make explicit the theoretical perspective guiding the search for patterns in the data. The phenomenon under investigation in this study is higher-level reading development, specifically, reading competence and reading maturity, and the theoretical perspective is essentially that of Gray's theory of reading development (1925a, 1937; Gray & Rogers, 1956), enhanced and expanded by consideration of more recent theoretical ventures into reading behaviors, reading approaches, and reading expertise.

As noted above, the case study approach is appropriate for this investigation insofar as the question that is being addressed concerns the intensive analysis and in-depth description of a complex and bounded social phenomenon (Barone, 2004; Yin, 2009). Because the desire here is to study a phenomenon rather than a group or issue, multiple cases are used instrumentally, rather than having the individual cases be the intrinsic research focus (Stake, 2006). Yin (2009) noted that multiple case studies are typically to be preferred to single case studies, in that they provide redundant corroborative evidence for any patterns observed, and are therefore more robust. They can also illuminate the phenomenon under scrutiny from multiple different vantages, while a single case study is typically either a uniquely exemplary case, a typical case, or an atypical case (Yin, 2009).

However, there are also trade-offs associated with the move to a multiple case study: the richness of description and individual focus that a single case study

provides must be to some extent left behind when a more comparative multiple case study approach is used (Barone, 2004; Stake, 2006). In addition, a multiple case study requires additional explicit consideration by the researcher of how each selected case serves the purpose of illuminating the phenomenon under investigation and falls within its bounds (Stake, 2006; Yin, 2009). Further, a multiple case study involves a considerable investment of time and resources in doing the data collection and analysis, and can produce unmanageably lengthy research reports (Stake 2006; Yin 2009). Barone (2004) pointed out that there are critics of the multiple case study approach, who see the more appropriate and familiar choices to be either a single case study (for richness of description) or a move to quantitative research (for generalizability of conclusions over multiple participants). However, both Yin (2009) and Stake (2006) have defended the viability of the multiple case study as a valid, appropriate, and informative qualitative methodology or design for addressing exactly the type of research question underlying this investigation.

The choice of the collective case study approach has certain consequences for what can and cannot be done or addressed in this investigation. A collective case study cannot directly address causality or why the phenomenon being described is the way it is (Creswell, 1998; Yin, 2009). The boundedness of the phenomenon being described must be respected, the phenomenon must be investigated in its real-life context, and the conclusions that are drawn cannot reach outside the theoretical scope of the cases considered (Barone, 2004; Creswell, 1998; Stake, 2006; Yin, 2009). Because of the multiplicity of variables invoked in capturing the complexity of the phenomenon, together with the relatively small number of data points, it is crucial for

the validity of a collective case study that there be multiple sources of evidence and that patterns detected be grounded upon converging and triangulated data (Creswell, 1998; Stake, 2006; Yin, 2009). In order to support the reliability of the conclusions drawn, there must be extremely careful documentation of procedures throughout the course of the data collection and analysis, to promote the likelihood that another researcher would come to the same conclusions if conducting the same study over again (Yin, 2009). Finally, because this type of study is a theoretically-grounded descriptive investigation of a complex phenomenon, the conclusions that are drawn do not generalize to a particular population but rather serve to expand and enhance the theory upon which the rationale and structure of the study were based (Yin, 2009).

The choice of the collective case study approach also has certain consequences with regard to appropriate data analysis and presentation. There must be a balancing of the particulars of the individual cases and the generality of the conclusions to be drawn from the cross-case comparisons (Stake, 2006). The descriptive data can include both more narrative formats and quantitative observations (Yin, 2009), and data presentation often benefits from the use of summative tables allowing more immediate access to relevant cross-case comparisons (Stake, 2006). Yin (2009) highlighted the importance for the collective case study researcher of providing the reader with a sense of reasonable exhaustiveness with regard to the amount of data collected, and a sense of completeness in what is provided to support the descriptions offered as conclusions, although it is not necessary that the evidence of this exhaustiveness and completeness be included in the flow of the narrative.

The complete case study should demonstrate convincingly that the investigator expended exhaustive effort in collecting the relevant evidence.

The documentation of such evidence need not be placed in the text of the case study, thereby dulling its content. Footnotes and appendixes, and the like will do. (p. 186)

A final data presentation issue in multiple case research is whether the narrative needs to include a detailed presentation of individual cases or whether cross-case conclusions should form the entirety of what is presented as results. For Yin (2009), issues of length and readability are important enough that he suggested that it is not necessary in multiple case research to display any of the individual cases explicitly. For Stake (2006), the strength of case study research is in its ability to maintain a connection to the particularities and realities of the individual cases, and he therefore suggested that so far as possible reports of multiple case studies should include some (perhaps abbreviated) individual cases. In line with this recommendation and following the reporting procedure used by Gray and Rogers (1956), this collective case study will present cross-case comparisons and conclusions while also giving a more in-depth view of the particulars of selected individual cases in reporting its results.

Participants

The selection of participants to provide the cases used in this collective case study was based on a number of considerations. When using a collective case study design, the cases are intended to illuminate the larger phenomenon under investigation, which is accomplished by a purposeful selection of relevant cases that

will "build in variety and create opportunities for intensive study" (Stake, 2006, p. 24). Stake (2006) recommends identification at the outset of the binding concept that makes each of the cases in fact a case of the phenomenon at issue, while Yin (2009) focuses on the idea of replication and each case as a replication that can collectively serve to validate the conclusions drawn about the overarching phenomenon. Barone (2004) also notes the intentional redundancy involved in the use of multiple cases to build an understanding of an underlying phenomenon.

In this study, the phenomenon is higher-level reading development in the form of maturity and competence. Given that such development has been suggested in the literature reviewed in the preceding chapter to be related to general developmental status (Gray & Rogers, 1956) as well as level of academic specialization (as suggested by Chall, 1983; Marton & Säljö, 1997, Pressley & Afflerbach, 1995; Schraw & Bruning, 1999), the selected participants were graduate students. Participants at the graduate level were the focus because they are likely to be highly competent or mature readers by virtue of their age and their level of educational experience (e.g., Chall, 1983). As evidenced by their status as graduate students, they have had strong and successful experience with using reading to achieve their own learning goals and they are currently active in reading challenging and specialized academic material.

Such participants can provide unique evidence regarding reading development that can illuminate the intersection or divergence of developmental paths leading to competence and maturity, and the roles in reading development of academic and personal reading. More pragmatically, they are also likely to have the self-regulatory

and motivational capacity enabling them to respond in a meaningful way to the challenging reading task presented. The solicitation to participate indicated that the study targeted adult competent readers; those who volunteered were thus likely to have reasonably high confidence in their own reading ability and also possibly to have some degree of interest in reading.

Sampling from the adult population in general (as done initially by Gray and Rogers, 1956) would target the necessary level of developmental maturity, but would be likely to tap into a much wider variety of levels and types of reading competence and levels of familiarity with learning from reading, as was found by Gray and Rogers. Sampling from undergraduates would also be problematic; they are not yet at an appropriate level of maturity developmentally, and further, are not likely to provide many highly competent or even competent readers (e.g., Fox et al., 2007; Fox et al., 2008).

The use of this type of select group, all graduate students vested in pursuing learning of a particular content area at a highly specialized level, but likely to be representing different levels of experience at that pursuit as well as different levels of developmental maturity (not all graduate students being necessarily in the same age range), creates the opportunity for seeing whether any evidence emerges of the hypothesized possible shift or restructuring of reading approach for such students, associated specifically with a general or domain-specific change in understanding of the purpose of reading and of their role as readers (as suggested by Chall, 1983; Marton & Säljö, 1997; Pressley & Afflerbach, 1995; Schraw & Bruning, 1999). Use of participants nested in a high-level academic context also supported investigation of

the importance of personal versus academic reading with regard to reading maturity. Using graduate students of varied levels of experience as participants rather than domain experts (i.e., faculty members) allowed the possibility of better discriminating the contribution of increasing specialization and expertise. However, it will be important to keep in mind that all cases were of a specific type of adult reader when drawing conclusions about higher-level reading development from what is seen in this collective case study.

A further decision regarding selection of cases for this study was related to the need to include participants from a variety of areas of graduate study. A few studies have suggested that there might be similarities in salient aspects of reading performance from participants in different areas of graduate study (Haas & Flower, 1988; Schooler et al., 1996), while other findings suggest that greater experience in or orientation toward the sciences might promote a tendency toward or away from particular reading behaviors, such as the making of author-related statements (Johnston & Afflerbach, 1985) or the use of an initial hypothesis strategy in reading unfamiliar text (Afflerbach, 1990b). Therefore, the inclusion of graduate students specializing in "hard" science, "soft" science, and the humanities seemed appropriate in order to allow for the possible emergence of a fuller range of possible competent and mature reading behaviors.

For a collective case study design, the number of cases should be sufficient to provide relevant variety and richness regarding the investigated phenomenon (Stake, 2006), or to replicate the critical aspects of the phenomenon in multiple situations (Yin, 2009), while remaining within reasonable bounds as far of quantity of data

given the closeness of the examination undertaken. The participants in this study who provided the cases to be used in generating the collective case study were 25 graduate students, which, as a collective, is close in size to Gray and Rogers's (1956) select group of 21 putatively mature readers. (An additional participant completed the first session with the structured interview, but was unable to schedule and complete the second session. Data from that participant are not included in any analyses.) A further aspect to consider is the idea of saturation; that is, that observations should continue to be collected until one is able to readily anticipate what is likely to be seen, and to readily categorize the types of behaviors or attitudes that are being seen (Shank, 2002). Although each participant offered a highly individual and fascinating case of reading development, by the time the 25th participant had been interviewed and observed, what I was seeing was confirmatory and reinforcing rather than opening new territory.

Participants covered a broad range of ages (from 21 to 59 years old) and levels of experience with graduate study (from having been accepted into a graduate program and not yet begun study, to having completed writing of a dissertation). They also covered a variety of types of academic experiences, including one participant with identified ADD, one who received remedial reading services as in childhood (and still struggled with reading aloud), one participant who did not complete high school, one participant who was home-schooled through high school, and several participants (both U. S. citizens and those from other countries) who did not speak English as a first language. There were eight participants whose area of study fell under the "hard" sciences (physics and biology), 15 in the "soft" sciences

(education, human development, psychology, and history), and two in the humanities (English literature and theology). Participants studying education (curriculum and instruction) were studying science and reading education. There were more females (15) than males (10). All participants but one were pursuing a PhD in their subject area; Susan (who was also the oldest participant) was completing a MEd.

Table 2 gives the breakdown of participants by relevant demographic characteristics; all names used are pseudonyms. Participants included four who learned to read in a language other than English, and five whose ethnicity was other than non-Hispanic White. However, to protect participant identity as far as possible, neither that information nor the institution at which they were graduate students is matched to individual participants in the table. The institutions attended were: the University of Maryland at College Park (15), University of Maryland, Baltimore County (1); Catholic University (1); Johns Hopkins University (1); Tulane University (2); Colorado State University (4); and the University of Southern California (1).

Table 2
Participants and Relevant Characteristics

	<i>Gender</i>	<i>Age</i>	<i>Area of Study</i>	<i>Years of Grad. Study</i>
Andrew	Male	34	History/Public Policy	7
Benjamin	Male	25	English	2.5
Anita	Female	21	Human Development	0.5
Carl	Male	25	Physics	0.5
David	Male	29	Physics	5
Bonnie	Female	29	Curriculum and Instruction	2
Edward	Male	31	Curriculum and Instruction	3
Cora	Female	26	Human Development	1
Frederick	Male	34	Ecology/Biology	7.5
Deborah	Female	33	Ecology/Biology	4.5
Emma	Female	31	Botany	4
George	Male	23	Botany	2
Frances	Female	27	Molecular Biology, Botany	3
Herbert	Male	28	Botany	1
Gloria	Female	34	Theology	7
Hannah	Female	30	Curriculum and Instruction	3
Jeffrey	Male	45	Social and Organizational Psychology	1
Jennifer	Female	32	Special Education	5
Linda	Female	26	Social and Personality Psychology	0
Lewis	Male	32	Curriculum and Instruction	4
Martha	Female	28	Curriculum and Instruction	4.5
Nora	Female	30	Curriculum and Instruction	5
Pamela	Female	30	Human Development	6
Regina	Female	25	Social and Organizational Psychology	3
Susan	Female	59	Curriculum and Instruction	2

In finding participants, use was made of contacts among fellow graduate students, friends, and family to identify potential graduate student participants among their circle of acquaintances. In addition, professors of Psychology, Reading Education, Special Education, and Quantitative Methodology at the University of Maryland were contacted and asked to suggest potential participants among their students. In each case, the suggested potential participants were contacted by email, told about the study, and asked if they would be willing to participate. No incentive

was offered to participants to encourage them to participate. All those contacted who expressed willingness to participate were used as participants, with the exception of one volunteer who was a graduate student in Statistics, whose plans for extended travel interfered. Graduate students who were not native speakers or readers of English were included; graduate students in this country who are not native speakers or readers of English must adapt their competence as readers to the demands of reading challenging text in English in order to be successful in their graduate studies.

Measures

In a collective case study, it is important to include multiple different data sources informing about the phenomenon under investigation (Barone, 2004; Stake, 2006; Yin, 2009). Examples of types of data that are typically included in collective case studies include observations, interviews, and artifacts or document (Barone, 2004). Another important feature is the potential for overlapping or triangulation of data supporting any conclusions to be drawn; it is highly desirable to have multiple forms of evidence upholding any conclusions that are reached (Stake, 2006). The types of observations and data that were considered to be necessary to support the building of this collective case study of higher reading development were drawn from what was done by Gray and Rogers (1956), while also expanding beyond what they did in order to accommodate more recent theoretical considerations. The types of data that were collected included self-report of reader characteristics, interview data, observations of reading behaviors, and artifacts related to performance as a reader. How these data were used in creating reader profiles and in the development of the

descriptions of mature and competent reading is discussed in next chapters on Data Analysis and Results.

Demographics. The demographics sheet (Appendix A) collected data to support the development of profiles and also more extended exemplar case studies of these readers, including their gender, age, and ethnicity, the language in which they first learned to read (if not English), the type of degree being pursued in graduate study, their department and area of specialization (if any), and the number of years of graduate study they had completed. Participants who did not first learn to read in English were asked to consider their reading in their native language in the structured interview. Status as a reader of English was considered important to know, given that the reading task involved an English-language text.

Structured interview. Participants were asked a series of open-ended questions about their reading background, their current reading status, their understandings related to reading, and their perceptions of themselves as readers (Appendix B), as drawn from but amplifying on Gray and Rogers's (1956) questions used with select cases. Given that reading is contextually-anchored, it was of value to see what emerged for participants themselves as important aspects that colored or shaped their contextualized perceptions of their own experience as readers; therefore the questions were framed with as little directiveness as possible. The sequence of questions as well as the specifics of what was addressed by the groups of questions were intended to provide the possibility of corroboration across multiple responses, in that the questions were aimed at allowing readers to provide a relatively consistent story about themselves as a reader in relation to these multiple aspects, and to build it

up in a relatively natural sequence that would make their unfolding of their own story flow in an unforced way.

With regard to reading background, the researcher-identified aspects of importance for describing and identifying competent and mature reading were:

- early reading experience, which was identified as likely to be particularly reading-supportive for fully mature readers by Gray and Rogers (1956);
- in-school and out-of-school reading experience, at the level of elementary school, and then beyond elementary school (identified as areas of theoretical interest in the cross-theory comparison of theories of reading development, and with regard to the type of reading development that occurs beyond the level of formal instruction in reading);
- experience of change over time as a reader (identified as critical in Chall's 1983 theory, and also suggested by Gray and Rogers); this is of interest also with regard to the idea of the young reader who already reads with a deeper approach (e.g., Bereiter & Scardamalia, 1993; Brown & Campione, 1990; Brown et al., 1981), and what such a reader's experience of change might be.

Each of these aspects was addressed in the first set of questions in the structured interview. The corresponding question in Gray and Rogers's (1956) interview for selected cases of mature adult readers was a biographical sketch, including home

environment and school experience as related to reading, academic training, and professional experience (question 1*a-d*, p. 262).

With regard to current reading status, the researcher-identified aspects of importance for describing and identifying competent and mature reading were:

- reading habits, including type of material read, amount of time spent reading for personal and other purposes, types of purposes for reading;
- interest in reading;
- importance of reading (all identified as important by Gray and Rogers, 1956).

The corresponding questions in Gray and Rogers's interview for their selected cases asked about depth and breadth of reading interests, purposes for reading, amount of voluntary reading per day, and degree of enthusiasm for reading (questions 2-5, p. 262).

With regard to understandings of reading, the researcher-identified aspects of importance with regard to maturity in reading were:

- readers' understanding of their active role in reading (identified as important in the literature on reading approach) and of flexibility in adapting to different reading situations (identified as important in every theory of reading development and in the investigations of reading maturity related to competency, in particular);
- their knowledge of reading (and in some cases how and where it was obtained), which was identified as important in Alexander's (2003b, 2006) theory of reading development and in the projective discussion of higher-level reading development (Alexander et al., 2011);

- what they think it means to be a good reader (identified as important in the literature on approach to reading).

There were no questions directly corresponding to these in Gray and Rogers's (1956) interview.

With regard to participants' perceptions of themselves as readers, the researcher-identified aspects that have potential importance for reading maturity were:

- readers' metacognitive awareness of their own reading as a behavior, including strengths and weaknesses, interests, attitudes, and goals (general and situation-specific), which was identified as important by Gray (1954), by Gray and Rogers (1956), in Chall's (1983) theory of reading development, and in the projective discussion of higher-level reading development (Alexander et al., 2011).
- readers' sense of identity as a reader, including all of the above aspects, which was identified as important in theories of reading development and in the literature on reading expertise.

Again, there were no questions directly corresponding to these in Gray and Rogers's (1956) interview.

The final question of the structured interview was simply an invitation for the participants to bring up any other ideas, issues, or observation about themselves as a reader that might have occurred to them and not have been directly elicited by the questions thus far.

Evaluation of knowledge/interest for passage topics. Participants were given a set of 27 items giving the first 85-95 words of selected entries in the first edition of the *Encyclopædia Britannica* (Smellie, 1768-1771/1979), and asked to indicate their likely level of knowledge of the content presented in this entry and interest in reading the rest of the entry as high or low (Appendix D). Before doing this, they were given an entire sample entry to read, to give them an idea of what a typical entry in this very old encyclopedia looks like (as suggested by the pilot study). The sample entry, on Hell, is given in Appendix E. It was chosen as representative of the content, structure, and tone of the selected entries from the *Encyclopædia Britannica*.

Once participants completed this evaluative task for all 27 items (for which they were allowed to take as long as they needed), they were asked to single out the four entries best representing each of the four evaluative categories for them: high knowledge and high interest (HK-HI); high knowledge and low interest (HK-LI); low knowledge and high interest (LK-HI); low knowledge and low interest (LK-LI). All participants were able to identify an exemplar entry for each category.

This evaluative task enabled the matching of reader and passages in the reading task in the second session. The matching of reader and passages is not a typical approach, because of the difficulty it produces in regard to cross-reader comparisons when the readers have seen different passages. However, the potential for additional sharpening of differences for the within-reader comparison of cross-passage differences by this type of individualized selection, and the availability in the

Encyclopædia Britannica of a large set of passages of comparable style, tone, and content made this alternative approach viable.

By matching readers and passages in this way, possible differences in how readers respond to passages for which they have different levels of knowledge and interest could be detected, and the possible different roles of high and low knowledge and high and low interest discriminated. The role of cross-situational reading competence in relation to independent or interdependent variations in topic knowledge and interest has been identified as important in theoretical (e.g., Alexander, 2003b; RRSg, 2002) and empirical investigations (e.g., Fox et al., 2009) of reading competence and maturity. Dichotomous categories of high/low for knowledge and interest were chosen for ease of identification of entries in each of the four relevant categories for passage selection, and were thought to be adequately discriminative for that purpose. Validation of the selected passages as high or low knowledge for each participant and across participants overall, along with discussion of differences in participant behaviors and outcomes that were observed are in the following chapters on Data Analysis and Results.

Gray and Rogers (1956) gave all of their selected cases the same selection to read, an article of approximately 525 words from the *New York Times* of December 18, 1951, about plans to take back for the general public use a park in Cairo, Egypt that had been used for a private club. Although Gray and Rogers did not assess prior knowledge or interest in relation to the topic of the article, they did ask participants after reading about what related ideas participants had brought to the reading of the article (question 7d, page 262).

Passage knowledge pre-assessment. Before reading and thinking aloud for the four selected passages, participants were asked to respond to a knowledge pre-assessment for each passage (Appendix F). This task was untimed. They were prompted with the beginning of the entry (the same material they saw on the knowledge and interest evaluation), and asked to give up to five points that they would expect to be discussed in the entire encyclopedia entry and to give as much detail as they could (to permit the discrimination of more strongly knowledge-based responses from simple mentioning of possible topics). This pre-assessment provided an additional validation of participants' level of prior knowledge in relation to the content being discussed in each passage, and a more elaborated view of their expectations of what the passage would be doing. Scoring and use of the pre-assessment are discussed in the following chapters on Data Analysis and Results.

Encyclopedia entries. Participants were asked to read four passages from among a set of 27 selected from entries in the first edition of the *Encyclopædia Britannica* (Smellie, 1768-1771/1979). The entire set of passages is given in Appendix G. Use of encyclopedia entries provided a way to maintain parallelism in content, tone, structure, and text style while varying the reader's likely level of knowledge and interest. The passages used were all between 700 and 800 words, represented a complete entry or sub-section of an entry, did not make extensive use of excessively archaic or technical vocabulary, did not refer to illustrations or figures, and did not require or otherwise refer to other entries or sections of the same entry.

Some of the passages used were entire entries in themselves and others were portions of larger entries. Some of the passages had portions of the original entry

edited out in order to achieve the word limit, as well as to remove sections that were excessively technical or had many unfamiliar words introduced. Those edits were not indicated in the text, to avoid disrupting the flow of reading and to maintain parallelism across the passages. All original spellings, capitalizations, and italicizations were retained. However, the original typeset used a descending 's'; where a descending 's' appeared in the original entry, it was changed into a regular 's' for ease of reading.

Passages were selected to provide a wide variety of topics discussed, as well as a variety of types of topics, ranging from the concrete and factual, such as the entry on Bridges, to the more abstract or philosophical, such as the entry on Beauty. This breadth supported the likelihood of a successful match of participants to texts for all four knowledge and interest categories. As it turned out, all of the 27 passages ended up being used, with every passage being selected by at least one participant as an exemplar. The distribution of the passages across the four evaluative categories by these 25 participants is given in Table 3. As the Table shows, there were also just three passages (those on Chemistry, Paper, and Sacrifice) that were chosen by only a single participant.

Table 3
Distribution of Passages Across the Four Evaluative Categories

<i>Passage Topic</i>	<i>Evaluative Category</i>			
	LK-HI	LK-LI	HK-LI	HK-HI
Abridgement	0	2	0	0
Algebra	0	1	5	0
Anabaptists	3	2	0	0
Astronomy	1	1	1	2
Beauty	3	0	0	1
Bridges	0	1	3	0
Chemistry	0	0	1	0
Fire	0	0	1	2
Frost	0	0	1	1
Gardening	1	2	1	2
Grammar	1	1	2	1
Hatching	1	2	0	0
Language	1	0	0	2
Logic	0	0	2	2
Marriage	1	0	1	1
Mechanics	1	2	0	0
Medicine	2	0	1	0
Minors	2	2	0	0
Mythology	1	0	0	4
Needles	0	2	1	0
Painting	2	0	0	1
Paper	1	0	0	0
Parents	0	2	1	1
Plants	0	0	1	3
Potatoes	2	1	1	0
Sacrifice	1	0	0	0
Silk	1	4	0	2

Using passages from such an old edition of the *Encyclopædia Britannica* provided a challenging reading experience with complex text, due to the nature of the vocabulary used, the frequently complicated sentence structure, and the general unfamiliarity of the way in which the topic is addressed. Reading these passages and comprehending them fully and successfully called upon reading knowledge, reading

strategies, and reading motivation. The comparable task used by Gray and Rogers (1956) was the reading of a single newspaper article, although related to a topic (public affairs in Cairo, Egypt) that might be relatively unfamiliar to their participants. They did not give an explicit rationale for the choice of this article.

In addition, the passages presented opportunities for higher-order thinking without directly requiring it, for example, the opportunity to recognize this as a multiple-text situation and to respond to the invitation to consider author purpose and context. In this regard, it is of great interest that all entries were produced by the editor, William Smellie; although he made use of other source material, he selected, edited, and wrote what appears in the entries. Readers' responsiveness to the author as varying by their level of initial topic knowledge and interest (rather than by any overt difference in the author) was therefore distinguishable in this situation.

There was also the opportunity for evaluative, critical response, at a minimum in considering whether the information presented is still held to be accurate today, and in considering whether the way in which the information is presented conforms to our models of reference texts or encyclopedias today. Finally, although it was hoped that participants would have higher or lower levels of knowledge or interest in the topics addressed by these passages, the passages are not themselves domain discourse, and their intended audience is not content area experts. As encyclopedia entries, the primary purpose of the passages was to inform any motivated reader, so that participants could presumably align their purpose reasonably well with the primary purpose of the author.

It must be noted, however, that the author was undoubtedly also addressing himself to content area experts and his academic peers in at least some of the entries, as noted in the introduction to this republished edition, so that there are a subtext and a secondary purpose present as well, which participants could also detect and to which they could respond.

Passage think-alouds. Participants were asked to think aloud while reading each of the passages. This task was not timed. The think-aloud instructions are given in Appendix H; these instructions are adapted from those that I have used with other think-aloud studies, which have functioned well. The adaptations include the specific mentioning of two types of behaviors that participants might be inclined to overlook in reporting their thoughts, rereading and being reminded of something. Because participants are not required to read aloud, there is a chance that rereading behavior could get overlooked or under-reported. Being reminded of something is a behavior that participants may not be sure is relevant to report in this situation, so it was considered to be important to mention. Participants were specifically requested to report *whatever* they were thinking and doing to emphasize that they should think aloud freely and not try to edit in order to report what they think might be interesting or important.

They were not required to read the passage aloud, and also were not prompted at regular intervals or if they were silent for an extended period. Reading the passage aloud or portions of the passage aloud represents itself a choice of reading strategy that can be obscured when participants are required to read aloud; in addition, it elicits some behaviors and strategies specifically associated with the task of reading

aloud that are not necessarily of interest here. Prompting readers to respond is a very typical practice in think-aloud studies, and prompts can be inserted at regular intervals in order to sample readers' thoughts in relation to particular text chunks or segments. However, it is my preference to let readers respond when something catches their own attention; in that way, although interesting data may be missed, what is collected is absolutely bona fide as the product of the reader's own awareness. When I have used prompting for participants who are saying little, what is elicited tends to be either no real response or an explanation rather than their spontaneous thought.

Participants had a practice think-aloud with the entry on Funeral Rites (Appendix H) to ensure that they were comfortable with the procedure and the reading situation. Before reading, the participants were told what they would be asked to do after reading, so that they could, if they chose, read toward the goal of responding to these outcome tasks. In particular, they were told that none of the outcome tasks would require recall. This aimed to diminish any order effect arising from participants becoming aware of the specifics of the outcome task after reading the first passage and consequently changing how they read for following passages. Participants read the passages in the following order: LK-HI, LK-LI, HK-LI, HK-HI. This order was intended to facilitate readers' comfort and engagement with the reading situation and to help mitigate fatigue effects, by having the likely most difficult LK-LI passage come after they had had a chance to experience what the texts and task were like, but before they were too tired, and by having the likely easiest and most engaging HK-HI passage come last.

These think-alouds aimed to provide evidence of interactions with text that were directed at the derivation of meaning as well as more metacognitive and higher-level evaluative behaviors and responses engaged in while reading. Gray and Rogers (1956) did not collect any comparable data in their study of selected cases. The use of think-alouds while reading to produce this type of data has been theoretically and empirically validated (e.g., Afflerbach, 2000; Pressley & Afflerbach, 1995), although it is important to bear in mind that think-alouds do not provide complete data, due to the limitation that readers may not report fully what they are thinking, and they cannot report what goes on below the level of conscious awareness. The coding of the think-alouds is described in the chapter on Data Analysis that follows. The coded think-alouds support the analysis of within-reader differences across the passages, as well as the comparison across readers of patterns in types of behaviors in relation to other assessed or observed aspects of reading maturity or competence. Possible identified aspects that are relevant to reading maturity or competence include:

- type of behavior displayed;
- level of the type of behavior displayed (identified as important in the literatures on reading expertise, reading competence, and reading approach);
- quality of the type of behavior displayed (identified as important in the literature on expertise and the literature on competence);
- possible goal addressed by the behavior (identified as important in the literatures on reading expertise, reading competence, and reading approach).

After-reading tasks and questions. After reading each passage, participants were asked to complete a set of after-reading tasks and questions (Appendix I), which

they did with the passage available to them. These tasks were not timed. They were asked to highlight up to five sentences or parts of sentences that they would include in a summary of the entry, to say in their own words what they might have learned from reading the entry, to give their evaluation of the reliability of the information presented in the entry, and to give their evaluation of the presentation of the material in the entry.

These questions aimed to provide information on multiple levels of possible outcomes from the reading experience. Scoring of the responses to these questions is described in the Data Analysis chapter that follows. The first question aimed at the relatively low-level but essential ability to successfully identify important elements of what was read (a standard assessment of comprehension, e.g., Kintsch, 1998; Scardamalia & Bereiter, 1991; Venezky, 1991a). The second question about what was learned was an intentionally open-ended question intended to enable some discrimination between readers who saw this reading situation as one involving the learning of content and those who viewed it as an encounter with an author and an experience of otherness (e.g., Alexander et al., 2011) and as an opportunity for self-development (e.g., Säljö, 1997).

The third question about reliability provided an opportunity for participants to bring forward their criteria for evaluation of reliability and to consider how to apply them in this somewhat unusual situation; the degree to which participants could adapt their criteria and create relevant and adequate standards for evaluation of reliability is of interest (identified as important by Gray and Chall in their theories of reading development, and in the literature on reading expertise). The fourth question asking

participants to evaluate the presentation of the material in the entry invited them to consider issues of style. Such a question asks readers to consider their response to the text *as* a text, and more directly points their attention to the fact that the text was constructed by an author. This question does not have a direct parallel in Gray and Rogers's (1956) study of selected cases, although in the preliminary broader studies where they also used literary texts, issues of response to or recognition of style were addressed. However, where such a question has been included in our work with undergraduates (Fox et al., 2008; Fox et al., 2009), it has produced very interesting data on reader expectations and responses. Therefore, it was included as an outcome, although codes have not yet been developed for these responses; these data do not contribute directly to the profiles developed, although they are incorporated in the more detailed presentation of the individual exemplar cases.

Gray and Rogers (1956) asked their selected cases to summarize the passage from memory, to evaluate the reliability of the facts presented, to evaluate the presence of author bias, to identify any background material they might have brought to the reading of the article, to state the possible significance of the article, to evaluate their agreement with it, and to give possible uses of the material in the article (questions 7a-g, p. 262). In the current study, readers were not asked to respond based on recall, due to the number of passages read. In addition, the role of recall in reading competence or maturity is not straightforward (e.g., Kintsch, 1993); the interactive dependence of higher-level responses on what is able to be recalled when responses are based on recall creates an additional level of necessary explanations.

As an evocation of what readers can do in the way of reading competence or maturity, it was considered appropriate and cleaner here to avoid recall effects in the tasks.

Post-task interview. After all four passages were read and their associated outcome tasks completed, participants responded to a brief set of open-ended post-task interview questions (Appendix J). The purpose of these questions was to gather further data on participants' perception of their reading and of their reading experience in this situation, to check on whether they actually did perceive the passages as offering different situations with regard to level of topic knowledge and interest, to inquire about the goals they might have been aware of pursuing, and to follow up on any interesting observations of behaviors during their think-alouds. These data were used to supplement and validate the data collected from the other data sources.

Procedures

Participation was in two individually conducted sessions; I ran both sessions for every participant. In the first session, the participant completed the demographics questionnaire, the structured interview (which was recorded), and the untimed knowledge and interest pre-evaluation. This session took between 60-90 minutes per participant.

The second session was typically held on a subsequent day, although for a few participants it was more convenient to hold the second session on the same day as the first session, with an interval of several hours between them. In the second session, the participant completed a knowledge pre-assessment for each of the four passages that were chosen based on his or her responses to the knowledge and interest pre-evaluation in session one. The participant was given think-aloud instructions, practiced thinking aloud until comfortable

with it, and then read the first passage and thought aloud while reading. The outcome tasks were described before reading began. The thinking-aloud was recorded for this and each of the remaining three passages.

The first passage read was the passage identified in session one as the exemplar for a LK-HI entry. After reading the passage, the participant responded to the four written outcome questions, with the passage available. The same procedure was followed for the second, third, and fourth passages. The second passage read was the LK-LI entry. The third passage was the HK-LI entry, and the final passage was the HK-HI entry. Two participants (Herbert and Lewis) did not read, think aloud, or complete outcome tasks for their third passage. In one case, this was because of my mistake in preparing the materials (which were different for each participant, due to the individualized selection of passages). In the other case, in which the participant was not a native English speaker, it was because of issues of difficulty and fatigue. I opted to have him read the fourth passage and skip over the third one because his intended third passage (Potatoes) was very similar to one he had already read on Silk in tone and content, and his fourth passage (Logic) presented a somewhat different type of material.

When all four passages were read and the outcome tasks completed, the participant completed the post-reading follow-up interview, which was recorded. After the follow-up interview was completed, the participant was invited to ask any questions he or she had about the study, its purposes, and the rationale for the tasks and texts used. None of the tasks in this session was timed, and this session generally took between 90 and 120 minutes per participant, although there were some participants who were quite fast and others who took up to 3 hours.

CHAPTER IV

DATA ANALYSIS

This chapter presents the data analytic procedures used in this collective case study, beginning with an overview of the rationale for the general data analysis process adopted. The analysis of the four main data types used to create summative reader profiles is then described in turn: demographics, responses to structured interview questions, think-alouds while reading the selected passages, and responses to the outcome questions. This description covers the development of theoretically-grounded and data-tuned coding schemes for each portion of the data, application of codes, and determination of reliability of the coding schemes. The validation of readers' topic knowledge status (high or low) for the selected passages through analysis of their responses on the knowledge pre-assessments is also addressed.

Overview

This process was similar to and yet had important differences from the approach to data analysis taken by Gray and Rogers (1956). They were attempting to develop a viable assessment instrument while at the same time operationalizing their developing construct of reading maturity. Important issues for them included objectivity, strong reliability, and standardized scoring units that produced identifiable and roughly equalized levels of rated reading maturity across different types of data. They ended up finding, however, that their scoring system was extremely difficult to use, and that, in the end, they felt that an overall holistic judgment of each reader by a knowledgeable evaluator would prove equally accurate and useful, and much less labor-intensive.

In this study, however, it would not be appropriate and it was not necessary to drive the data to that level of formalization and uniformity. In looking across the contributions of different types of data, it was of interest to see which aspects emerged without constraining them to move together uniformly. The aim was primarily description, supported by the creation of profiles. The affordances of the different types of data in furthering richness, triangulation, or discrimination in describing reading maturity as it appeared in this set of cases meant that sometimes it was appropriate to identify the presence of a given aspect, while at other times gauging relative strength or prevalence was more appropriate.

The following sections describe the development of coding schemes for each type of data. In each case, the final step in the data analysis process was determining which parts of these codings (for the demographic, interview, think-aloud, and performance data) were important to include in the reader profiles, and what range of responses were to be taken as indicating likely reading maturity. Here the important constraints were the desire for both maximal compactness and maximal informativeness in the profiles, and the need to have a valid argument for why any given response category was evaluated as a possible indicator of reading maturity (see, e.g., Yin, 2006 on ensuring high quality in case study data analysis).

I began this final step with a completely inclusive visual representation of every analyzed type of data: all of the code categories I had developed and all participants' codings (on graph paper). I then narrowed those down or condensed them until I had achieved what I felt was the best summative representation of the meaningful aspects of the data across all of the cases and data types. These

summative representations are the reader profiles included in Appendix K. This type of cross-case synthesis based on visual representation of important features of the entire set of data is identified by Yin (2006) as an appropriate analytic strategy for collective case study situations. It is also critical to show that all of the important data were taken into account, so as to minimize the possibility of an alternative interpretation based on data that were not considered (Yin, 2006). For this reason, wherever data were coded but not used in the reader profiles or were considered not systematically codable, an explicit rationale for that decision is given.

Table 4 presents the types of data collected, together with the way in which each contributed to the creation of profiles and the larger understanding of the phenomenon of higher-level reading development, and the coding used for each type of data. In addition, it is important to note that the summary of that data as presented in the profile aims at discriminating or indicating maturity, which means that a deliberate selection of relevant aspects of the data and evaluation of their likely relevance specifically for reading maturity was made. A somewhat different approach to presentation of the data and representation of their meaning would have been used for reading competence. It was not feasible to have the profiles serve both aims, and reading maturity was the primary focus of this investigation. However, the discussion of the coding schemes indicates additional aspects coded (but not directly appearing in the profiles) that were of relevance for reading competence and that can be brought to bear in the description of reading competence.

Table 4
Data Sources, Related Constructs, Use, and Coding

<i>Data Source</i>	<i>Related Constructs</i>	<i>Use and Coding (Bold Codes → Possible Maturity in Profile)</i>
Demographics questionnaire (Appendix A)	Reader characteristics: <ul style="list-style-type: none"> • Gender (Q1) • Age (Q2) • Ethnicity (Q3) • Language background (Q4) • Graduate-level experience (Q5, Q6) • Area of study /specialization (Q7, Q8) 	Supplementary descriptive data (Q1, Q3, Q4, Q7). Profile-related data (Q2, Q6, Q8). (Profiles given in Appendix K) Age coded as Younger, Mid-range, Older . Graduate-level experience coded as Low, Moderate, High , Very High . Area of study grouped as Natural Science, Social Science, and Humanities .
Structured interview (Appendix B)	Reading background: <ul style="list-style-type: none"> • Learning to read (Q1) • In school (Q2a-b) • Out of school (Q3a-b) • Change over time (Q4a-b) Reading habits: <ul style="list-style-type: none"> • General (Q5) • School or work related: what (Q6a), why (Q6c), how much (Q7a) • Personal: what (Q6b), why (Q6c), how much (Q7b) • Reading enthusiasm: interest (Q8a-b), 	(Coding schemes for interview in Appendix L) Supplementary descriptive/validation data (Q6a, Q6c, Q7a). Profile-related data (Q1, Q2, Q3, Q4, Q5, Q6b, Q7b, Q8, Q9). Learning to read coded for Ease/Difficulty , Enjoyment , School/Out of School . School coded as Positive/Negative/Mixed Affect , Text Analysis . Out of School coded as Merging/Separation . Change coded as Stable/ Positive/Negative Change, Aspect (Efficiency, Effectiveness , Attitude , Reading Habits , Lens). Amount (hours daily) coded as Low, Regular, High . Number of Text Types coded as Low, Middle, High . Enthusiasm coded as Low, Moderate, High-Conditional, Very High . Importance coded as Practical, Escape, Professional, Current Events, Personal-Social, Self-Development .

	importance (Q9a-b)	
	<p>Understandings of reading:</p> <ul style="list-style-type: none"> • What happens during reading (Q10a-c) • Reading-related knowledge (Q11a-b) • Nature of good reading (Q12) <p>Self-perception as reader</p> <ul style="list-style-type: none"> • General (Q13) • Strengths and weaknesses (Q14) • Interests (Q15) • Goals or approach (Q16, 17) 	<p>Supplementary descriptive/validation data (Q11, Q15). Profile-related data (Q10, Q12, Q13, Q14, Q16, Q17).</p> <p>During reading coded as Cross-Over Fiction/Nonfiction, Author. Good reading coded as Efficiency/Understanding, Decoding, Attitude, Goal, Message, Reading Habits.</p> <p>Self-Description coded as Low, Moderate, High. Strengths and Weaknesses coded as Reading Habits, Process, Purpose, Stance (Very Weak, Weak, Mixed, Strong, Very Strong). Approach coded as Depends, General (Enjoyment, Effort, Escape, Evaluation, Learning). Goals coded for context as School/Work, Leisure, General and for goal as Answer Questions, Understand, Escape, Analyze, Share, Learn/Judge.</p>
Knowledge pre-assessment (Appendix G)	Prior topic knowledge	<p>Validation data for high/low levels of initial topic knowledge for exemplar passages.</p> <p>Coded for number of points (0-5) indicating specific, accurate topic-related knowledge. (Coding scheme in Appendix M)</p>
Think-alouds	<p>Behaviors during reading:</p> <ul style="list-style-type: none"> • Nature (meaning, message, text, task, affect/motivation) • Relative prevalence • Amount 	<p>Profile-related data, used for between-individual comparison over all four passages. Descriptive data for competence, used for within-individual comparison between passages.</p> <p>Set of 50 different codes (Appendix N); coded for individual behaviors and as grouped under larger categories of types of behaviors (meaning, message, text, affect/motivation). Average proportion of message/text related behaviors coded as Low, Middle, High. Engagement level coded as Very Low, Low, High, Very High.</p>
Outcome tasks (Appendix I)	Reading performance	Profile-related data (Q2, Q3), used for between-individual comparison over all four passages. Descriptive data for

	<ul style="list-style-type: none"> • Comprehension (Q1) • Learning (Q2) • Evaluation - reliability (Q3) • Evaluation - presentation (Q4) 	<p>competence, within-individual comparison between passages.</p> <p>Learning coded for In Text, About Text, From Text, About Context, average times latter three present across passages coded as Low, Middle, High. (Coding scheme in Appendix O)</p> <p>Reliability coded for Agreement, Argument, Discourse, Specificity, Bias; average times latter three present across passages coded as Low, Middle, High. (Coding scheme in Appendix P)</p>
<p>Post-reading interview (Appendix J)</p>	<p>Perceptions of reading experience</p> <ul style="list-style-type: none"> • Overall (Q1) • Knowledge or interest-related differences (Q2) • Reading goals (Q3) • Specifics of what was seen during think-alouds (Q4) 	<p>Supplementary descriptive/validation data.</p>

Demographics

The data from the demographics questionnaire that were used in creating profiles were age, years of graduate study, and area of study. Degree aimed at was not used, because all participants but one were pursuing a PhD. Learning to read in English (or not) was not considered to provide data that would be directly relevant with regard to level of reading maturity, although it could be of interest for reading competence. No reliability analyses were considered necessary for the codings for these categorical self-reported data.

Age. Age was of interest as an indicator of general developmental status. The age range in this group of participants was from 21 to 59. Dividing the data roughly into thirds produced a younger group (ages 21-27) including 8 participants, a mid-range group (ages 28-31) including 9 participants, and an older group (ages 32-59) including 8 participants. The categories younger, mid-range, and older were used in the created profiles under age, with greater age (that is, being in the older group) assumed to be a potential indicator of likely greater capability of reading maturity (following Gray and Rogers, 1956). From the other data, there was some indication that greater general maturity tended to be associated with greater willingness to consider another person's perspective, which would be in line with this coding. There is also the possibility that being an older learner could reflect a more stable or deep-seated interest in learning and desire for self-development; this is somewhat beyond the scope of these data, however, which focused on reading.

Years of graduate study. Years of graduate study was interesting as an indicator of level of experience with the type of higher-level academic reading that is

expected to support a shift to a higher level of reading development (e.g., Chall, 1983; Schraw & Bruning, 1999) as well as indicating the amount of time dedicated to pursuing an increasingly more specialized area of knowledge and interest, which has also been suggested to be implicated in the movement to a higher level of reading development (e.g., Alexander, 1998, 2003b, 2006; Pressley & Afflerbach, 1995).

The range of years of experience in this group of participants was from 0 to 7.5. Considering the typical trajectory of experience in graduate school, where the first few years are taken up primarily with completion of coursework, and later years are devoted more toward identification and pursuit of a specific research interest, an appropriate division of participants into categories reflecting level of experience was thought to be: low (0-1 years, including 6 participants); moderate (2-3 years, including 8 participants); high (4-5 years, including 7 participants); and very high, (6 or more years, including 4 participants). These categories were used in the created profiles under experience, with high or very high experience assumed to be a potential indicator of likely greater capability of reading maturity. From the other data, such as participant responses regarding change as a reader and regarding how they would read for academic purposes, it also appeared that increased graduate-level experience did tend to support a shift in approach to reading toward critical evaluation and view of the big picture.

Area of study. Participants reported areas of study falling under three larger categories: natural sciences (Physics, Ecology, or Botany, 8 participants); social sciences (History, Psychology, Human Development, Education, 15 participants); and humanities (Theology, English Literature, 2 participants).

An a priori argument could be made that study of the domain of reading itself (such as by studying reading education, which was the case for several participants) would be related to reading maturity (e.g., Alexander, 1998, 2003b, 2006), as indicative of greater knowledge and interest related to reading. However, for the level of experience and specialization of these participants, there was no strong suggestion in their other data that study of reading education per se contributed to a more mature reading stance or reading performance. In particular, these possible issues emerged in the other data with regard to study of reading education in relation to reading maturity: a focus on decoding and children's learning to read for meaning as what are at stake in reading development, and a heightened attention to the reader's side of things, with particular regard to the effortful and situation-specific deployment of comprehension strategies. Therefore, only study of the humanities was coded as a possible marker of reading maturity. This choice was supported by theoretical reasons related to the perspective on reading adopted here, which were supported by what was seen in the other data. These reasons included the approach to text as authored and the aim of learning from text for even non-informational texts that are characteristic of higher-level study of the humanities.

Structured Interview

The 25 recorded interviews were transcribed by me into separate Word documents, and these documents became the data used in all analyses related to the interviews. (For one participant, Anita, the tape ran out before the end of the interview, and her responses to the last few questions were lost; however, I had also taken notes, and was able to reconstruct the gist of her comments.)

The development of coding schemes for the structured interview data was an iterative process that is explained in detail here, with the understanding that it was carried out the same way for the data from each question or grouped set of questions. The process began with an initial read-through of the transcripts for all 25 participants, going question-by-question (e.g., reading all Question 1 responses for all participants in sequence), taking summative notes, and identifying possible themes of interest. Based on that first read-through, the entire transcript for each participant was globally coded for a number of themes, to determine their possible utility in summarizing or highlighting patterns. These themes included: expression of affect or enjoyment related to reading (positive or negative); expression of ease or difficulty related to reading; and compartmentalization/differentiation or merging of personal or out-of-school reading and academic reading, reading for enjoyment and reading to learn, and reading fiction and reading non-fiction. These codings were indicated by highlighting and remained evident in the transcript as it was further analyzed. They ended up being useful in the subsequent coding of several questions, as will be seen in the more specific descriptions of the coding schemes for each question.

The next step was to chunk up the transcripts by question or question groups. At this point it was necessary to do some minor re-arranging of transcript material, because participants occasionally revisited a question as we went along, or responded to one question with information that related more directly to another. Decisions to do this re-arranging were based on the notes taken in the first read-through. In each case, where material was moved around, it was identified as having been moved and also kept visible but marked off from the other text where it had originally occurred.

The remainder of the analyses used the documents containing these reorganized versions of the transcripts (e.g., all Q1-related responses in one document, all Q2 responses in another, and so forth).

The next step was focused attention on each set of data to develop specific codes for that set. I went into looking at the data with certain expectations about what would be highly relevant or salient for reading maturity, as well as certain intuitions about what might be interesting in a speculative kind of way, for each type of data. As I read through, I pulled out themes that corresponded to these—both more tentative and speculative ideas that had potential for being relevant, and those that immediately and directly suggested themselves as important for reading development according to my theoretical perspective. (In this respect, this analysis is essentially personal, in that the selection of what went into the data-analysis machinery was driven by my perspective, my antennae, and my questions.) Because of the open-ended character of the questions asked, what participants produced as responses could vary widely in length and in the breadth of topics addressed, making identification of codable patterns across the cases a trade-off between sensitivity to interesting differences or similarities and willingness to let go of them where they seemed too marginal or not appropriately applicable across multiple cases.

This initial fine-grained and inclusive approach was followed by the creation of broader categories, keeping in mind two constraints: does this aspect of the data illuminate the nature of higher-level reading development across multiple cases, and is it reasonably codable? With provisional coding categories in hand, I then returned to the data and did fine-tuning of these coding categories, making sure that everything

of real value was captured and had a happy home, that categories did not proliferate beyond reasonable usefulness, and that categories proved useful across multiple cases. Once that point was reached, I went back and did a final coding of the data, using the fine-tuned coding scheme developed. For every category, I coded which of the possible codes was present in the participant's response, (with the possibility that multiple codes could be present), or whether the participant's response did not include any content for which this category was applicable. The final step, that is, the transition from these categories to the subset included in the reader profiles, involved the reductive and evaluative considerations described earlier. (The final categories, codes, and examples of codings for the structured interview questions are given in Appendix L).

For determination of reliability of these coding schemes, a randomly selected subsample of the data (20%, or five participants) for each question was independently coded by another rater, who was given the list of categories and codes for each question (as appears in Appendix L), an explanation of what the category meant and what the codes were going after, examples of codings, and clean transcripts to code with codable content marked out in brackets. Agreement in assignment of specific codes to this identified content was considered to support the reliability of the coding scheme. For these coding schemes as well as for those used for the think-alouds and outcome data, the type of interrater reliability aimed for was consensus (Stemler, 2004). This form of interrater reliability, as determined by percentage exact agreement, was considered to be appropriate for this situation in which different codes represented qualitatively different ideas, and as indicating that the coding

scheme could be similarly applied by reasonable raters. The aim was for interrater consensus estimates greater than 70% exact agreement, following Stemler (2004).

All differences were resolved by discussion.

Learning to read. Question 1 of the structured interview was, "What do you remember about learning to read?" Responses to this open-ended question were coded for the presence of expressions of positive affect or enjoyment related to learning to read (no negative expressions related to affect or enjoyment were seen for this question), for the presence of expressions of ease (or awareness of mastery) or of difficulty related to learning to read, and for mention of learning to read as occurring in school or out-of-school (see Appendix L for the coding scheme and examples of the codings).

Enjoyment and difficulty or ease/mastery with regard to learning to read were both included in the reader profiles as indicators of the nature of readers' initial encounter with reading, with enjoyment and ease/mastery taken as possibly associated with later reading maturity. These data were considered to be important because Gray and Rogers (1956) found that their select cases of mature readers tended to report having had very positive experiences of early reading. Strength of positive identification of self as a reader could very well begin with a relatively unmediated and positive taking up of reading for oneself. There were some differences among participants in whether they spontaneously associated enjoyment with learning to read or not, and in whether they recalled learning to read as having been easy or difficult for them, and these codings captured those differences.

Mention of learning to read in connection with in-school or out-of-school situations was used in the profiles to capture participants' memory of initial association of reading with their own personal pursuits, with "Out-of-school" taken as indicative of an initial step into reading (or a memory of such a step) that would be likely to be supportive of reading maturity. This evaluation is suggested by the perspective on reading adopted here and by Gray's theory of reading development, and further supported by the themes that emerged in the data in responses to later questions regarding compartmentalization or differentiation of reading by whether it is personal or academic, for learning or enjoyment, of fiction or nonfiction.

Interrater reliability for this coding scheme was extremely strong, at 100% exact agreement.

Reading in and out of school. Question 2 of the structured interview was, "What were your experiences with reading like in elementary school? How about after that?" Question 3 was similar, addressing out-of-school reading experiences (see Appendix L for the coding scheme for these questions with examples).

Responses to Question 2 were coded similarly to responses to question 1 with regard to the presence of positive/negative affect, for the same reasons given there. Ease and difficulty were not coded, because mention of ease in relation to school reading was present in the response of only one participant. For Question 3, out-of-school reading, responses relating to affect were nearly uniform in being positive, and very few mentions were made of difficulty or ease; these aspects were therefore not systematically coded. Because responses to these questions spanned the time period from elementary school into college, I was also interested in seeing whether

participants identified any particular trajectory with regard to reading in their own experiences. I therefore coded for the participant's mentioning of a falling off or improvement (or both or neither) in some aspect of reading over time, for both in-school and out-of-school reading. However, I ended up not using these codes regarding trajectory in the reader profiles, as this information was provided more directly in Question 4 about change as a reader.

An interesting phenomenon that emerged here (as well as in responses to Question 4 regarding change as a reader) was the existence for many participants of a kind of “Garden of Eden” of reading in childhood, when they read (mostly fiction, but there was also some mention of other genres, particularly biographies) hugely, effortlessly, immersively, and with great enjoyment. They looked back on this period with nostalgia and sometimes guilt, or even with reverence as representing their ideal of reading and of themselves as a reader. The forces driving them out of Eden tended to be identified as the increased general workload and specific reading demands of high school, and the development of greater interest in social interactions and other types of activities. This will be of interest to return to in later chapters, when considering the compartmentalization of reading and its importance for reading maturity and reading competence.

In addition, a number of the first participants mentioned having had an experience, typically in high school as in an AP or IB class, or also in college in a literature or humanities class, with close textual analysis (usually but not exclusively of literary text) focused on the author's creation of meaning through specific choices. In later interviews, therefore, I tried to make sure to ask about whether participants

could identify such an experience as present in their own school experiences of reading, if it did not come up spontaneously. Gray and Rogers (1956) similarly noted that a common theme in the experiences of their selected mature readers was exposure to intensive literary analysis and introduction to literary appreciation.

An additional code category used for the responses to these questions was whether participants responded in ways indicating compartmentalization or merging (or both or neither) of their in-school and out-of-school reading, reading of fiction and nonfiction, or for learning versus enjoyment. This theme was of particular interest with regard to the reading development of these participants who had all chosen to engage in continuing pursuit of academic expertise, and had theoretical relevance for the identification of possible reading maturity from the point of view of the perspective on reading adopted here, in which a general approach to reading as reading to learn in support of one's own self-development (and extending outside of simply academic or nonfiction reading) is taken as the path of reading maturity.

All of these codings (other than that for trajectory) were incorporated in the reader profiles. As before, positive affect (as present in discussion of school-related reading) was taken as indicative of possible later reading maturity. Exposure to intensive text analysis and a response indicating merging of the aspects of reading identified above (without also indicating separation) were similarly taken as such indicators.

Interrater reliability for this coding scheme was very strong, at 92.1% exact agreement.

Change as a reader. Question 4 of the structured interview was, "Do you think you've changed as a reader over time, or do you think you've stayed pretty much the same? Why?" Responses to this question were coded for whether participants indicated that they felt they had changed or not, and if they had changed, whether they characterized that change as positive or negative (or both).

Responses were also coded for the aspect(s) of reading that participants indicated as having changed. The codes used were: efficiency (e.g., speed, ability to skim or scan); effectiveness (e.g., ability to derive understanding of what was read, get the main idea or big picture); attitude (e.g., confidence, interest, enjoyment); reading habits (e.g., amount read or type of material read); and lens or perspective (e.g., approach to text in a questioning, evaluative, or critical way). The final coding used for responses to this question was with regard to what readers identified as the source of the change they described, with possible sources being general school or academic experience, graduate school experience in particular, or general maturation.

All of these codings with the exception of the coding for source of change were used in the reader profiles. (The coding scheme for this question and examples of the codings are in Appendix L). Although interesting from a research perspective in relation to mechanisms of reading development, information regarding the reader's perception of the source of change did not directly bear on their own status with regard to reading maturity, except possibly at a meta-level beyond the scope of what this study is trying to address. Positive change (that is, growth or development as a reader) was coded as indicative of possible reading maturity; but only if it was in relation to change in attitude, reading habits, effectiveness, or perspective. Efficiency

is a relatively low-level aspect of reading as processing, and therefore improvement in efficiency did not seem helpful in distinguishing readers who were at or moving toward maturity. Effectiveness could be argued against for a similar reason, but as can be seen from the examples in the Appendix, this was a relatively broad category, going beyond simple understanding of the text to include also analysis or synthesis or other higher-level interactions.

Interrater reliability for this coding scheme was solid, at 85.0% exact agreement.

Current reading habits. Participants' current reading habits were addressed in Questions 5, 6, and 7. Question 5 was, "How would you describe your current reading habits?" Question 6 was, "What do you typically read for school or work? How about for your own purposes?" (There was originally an additional third subpart to this question, asking "Why do you read that," but it ended up not fitting naturally into the flow of the interview, and was not used.) Question 7 was, "How much time do you typically spend reading for school or work? How about for your own purposes?"

In their assessment of reading maturity, Gray and Rogers (1956) put considerable emphasis on leisure reading habits: type of self-chosen reading (challenging or not); breadth of self-chosen reading; breadth of self-chosen purposes for reading; and amount of self-chosen reading. This required a fairly elaborate analytic apparatus and a very detailed set of interview questions, which was not in line with my aim here.

I had narrower expectations regarding what I hoped to get from these data. Out of the large volume of data produced by this set of questions, I was interested in checking that participants were in fact doing the same general type of challenging reading for school across the different areas of academic specialization. The data regarding the amount of reading participants were doing for school or work were important for verifying that participants were engaged in some amount of regular academic reading, which they all reported to be the case. I also wanted to determine the regularity and amount of their leisure reading and the breadth of their leisure reading, that is, what types of reading material they selected more or less regularly. The codes that were used addressed the amount of leisure reading (in hours per day); and the number of text types they indicated that they read. The breadth of text types mentioned was cross-checked against and in a few cases supplemented by information in their responses to Question 15 regarding interests as a reader.

With regard to school-related reading, I simply made a list of the types of texts participants reported reading. Participants in the Natural Sciences and Social Sciences uniformly reported reading journal articles as the main type of school-related text, as expected. This was different for the two Humanities graduate students, who were reading literature/philosophy and theology/philosophy primarily, and the History graduate student, who was reading government papers and newspapers. These data were not further coded and not used in the profiles.

The specific codes for amount of leisure reading were less than 1 hour per day, 1 hour per day, and more than 1 hour per day. The range was from less than 1 hour (or no specific amount, but irregular or definitely less than academic reading) to

4-6 hours per day. The possible text types coded under breadth of leisure reading were: fiction (mentioned by all but two participants), nonfiction, magazines and newspapers, religious or self-help. Online reading was also mentioned by nearly all participants, but participants had a much harder time estimating amount of time spent reading online for school and for leisure. The coding scheme for this question and examples of the codings are in Appendix L. I also coded whether participants reported reading these different text types (including online) regularly or irregularly, but, as noted below, this did not end up getting used.

What was used in the reader profiles was daily amount of leisure reading: low (less than 1 hour); regular (1 hour); and high (more than 1 hour). More than one hour per day of leisure reading was considered to be an indicator of possible reading maturity, following Gray and Rogers (1956). Number of different text types regularly read was also used, arrived at by simply adding up the number of text types participants mentioned as ones they read, from among fiction, nonfiction, magazines and newspapers, and religious or self-help. These were grouped as: low (1); middle (2); and high (3 or 4), with high responses considered indicative of possible reading maturity.

Online reading (e.g., of email, blogs, social media, news or current events, sports-related websites, research for health information or with regard to planned purchases, and so forth) was not included as another text type, given the difficulty of figuring out exactly what types of text participants were actually likely to be encountering, and whether this represented additional breadth of reading beyond the text types already identified. I also determined that knowing whether participants

read the different text types regularly or irregularly did not add additional valuable information for the reading profiles beyond knowing their amount of daily leisure reading and the breadth of their leisure reading choices, and seemed likely to present difficulties with regard to reliability of coding.

Interrater reliability for this coding scheme was very strong, at 100.0% exact agreement.

Interest in reading/Importance of reading. Question 8 of the structured interview was, "How interested would you say you are in reading? Why?" Question 9 was, "How important would you say reading is for you? Why?"

Responses to these two questions were merged, and coded for enthusiasm for reading and importance/value of reading. Responses related to enthusiasm for reading were coded as indicative of one of four possible levels of enthusiasm for reading: very high (e.g., expressions of extreme or superlative interest or enjoyment of reading for its own sake); high-conditional (e.g., expressions of being highly interested in reading for instrumental purposes or under certain circumstances); moderate (e.g., expressions of interest or liking); and low (e.g., expressions of little or no interest in reading). All participants responded to Question 9 that reading was very important for them. Therefore, responses regarding importance or value of reading were coded with regard to the reason(s) identified for placing importance or value on reading, including: professional (e.g., related to work or academic goals); personal-social (e.g., related to personal, social, or civic engagement) ; self-development (e.g., related to self-understanding, intellectual challenge, or meeting spiritual needs); escape (e.g., related to relaxation, distraction, entertainment,

stimulation); practical (e.g., related to accomplishing practical tasks or getting practical knowledge); current events (e.g., related to following or keeping up with current events). It was interesting to see that the set of important purposes identified by these 25 participants ended up substantially replicating the major categories of purposes for reading generated a priori by Gray and Rogers for use in their study (1956). The coding scheme for this question and examples of the codings are in Appendix L.

All of these codings were used in the reader profiles. For enthusiasm, very high enthusiasm was considered indicative of likely reading maturity, as suggested by the theoretical perspective on reading guiding this investigation and in line with the treatment of similar data by Gray and Rogers (1956). Of the different reasons for valuing reading, only self-development was coded as indicative of likely reading maturity, again in line with the perspective on reading adopted as well as with the approach taken by Gray and Rogers.

Interrater reliability for this coding scheme was adequate, at 76.5% exact agreement; all differences arose in relation to coding the reasons for valuing reading.

What happens during reading. Question 10 of the structured interview was, "How would you describe what you do when you're reading? Is there work involved? Are there differences in different situations?" Participants across the board described some type of effortful attention during (some types of) reading; beyond that, to what they described directing their attention covered a wide range of possible reading-related activities. Although this certainly provided interesting information, the question of what they aim at in reading was addressed more directly

in Question 17, and was coded for there. Therefore, responses to this question was coded for the presence of indications of cross-over phenomena: the experience of some type of flow or effortless enjoyment when reading nonfiction or academic material, and the experience of effortful engagement and the intention to learn when reading fiction or for pleasure. Finally, responses were also coded for awareness of the presence of an author, as signaled directly or by mention of reading as conversational or argumentative. The coding scheme for this question and examples of the codings are in Appendix L.

All of these codings were used in the reader profiles. Showing evidence of cross-over phenomena for nonfiction or fiction was taken as likely evidence of possible reading maturity, along with awareness of reading as communicative, as signaled by awareness of the presence of an author when reading. Interrater reliability for this coding scheme was very strong, at 100.0% exact agreement.

Reading-related knowledge. Question 11 of the structured interview was, "Is there anything you think you know about reading? How and when did you learn that?" This question proved to be challenging for all participants, which was in itself an interesting phenomenon to see. Given participants' difficulty in even articulating anything they thought they knew about reading, for the most part I did not go on to ask the second part of the question. It was extremely difficult to come up with a workable coding scheme for responses to this question that would capture patterns across the diffuse and divergent data, which ranged from very personal observations about how they learned to read and its effect on their later reading speed to broad generalizations about the interactional nature of reading. For this reason I did not use

these data in the profiles. Questions 13 and 14 addressed specifically what they know about their own reading, and were able to capture that aspect of these data more directly.

Good reading. Question 12 of the structured interview was, "What do you think it means to be a good reader?" Responses to this question were coded for the aspect(s) of reading identified as important for being a good reader, including: efficiency/understanding (efficiency in reading or getting an understanding of the text); message (going after or grasping a larger message or use of the author's message); goal (adjusting one's reading to one's goal, or being able to reach one's goals through reading); reading habits (choosing challenging reading, reading a wide variety of types of text, reading a lot); attitude (stance toward reading with regard to enjoyment, confidence); and decoding (being able to readily identify words, reading fluently). The coding scheme for this question and examples of the codings are in Appendix L.

All of these codings were used for the reader profiles. It was very interesting to see that participants as a collective came up with basically the same aspects related to maturity or excellence in reading identified by Gray and Rogers (1956)—with the exception of decoding, which in this group of adult readers was mentioned only by certain participants who were studying reading education. In line with Gray and Rogers and appealing again to the idea of self-awareness and maturity suggested with regard to the previous question, mention by participants of message, goal, attitude, amount, and type of reading as characteristics of good reading were taken as

indicative of likely greater reading maturity. Interrater reliability for this coding scheme was strong, at 92.3% percent exact agreement.

Self-description as a reader. Question 13 of the structured interview was, "How would you describe yourself as a reader?" Question 14 was, "Do you have any particular strengths or weaknesses as a reader?" And Question 15 asked, "Do you have any particular interests as a reader?" Questions 13 and 14 were merged and analyzed together. Responses to Question 15 tended to focus primarily on text type and thus were largely redundant with the information given regarding current reading habits. Therefore, these responses were not separately coded, but were used to supplement and corroborate the responses to Question 6.

Responses regarding self-description were coded for participants' self-identification as a very good reader (high), an okay reader (moderate), and not a very good reader (low). I also coded whether in making this determination participants made some kind of comparison to the presumed reading capabilities of others. Responses regarding strengths and weaknesses as a reader were coded for: reading habits (breadth of reading capacity, amount of reading, and attitude toward reading); process (speed, attention or focus, and vocabulary or language-related issues); purpose (reading for details, reading for the big picture, and reading to use/evaluate); and stance (self-awareness and openness). Each of the codings indicated whether participants judged themselves as strong or weak (or both) with regard to this aspect, or did not bring it up. It was very interesting to see a tension that emerged here between speed of reading and level of focus, as well as the high value (and great degree of social comparison involved) that appeared to be placed on reading rapidly;

these issues will become important in considering the nature of reading competence. The coding scheme for these questions and examples of the codings are in Appendix L. Interrater reliability for this coding scheme was solid, at 91.2% exact agreement.

For the profiles, I did not use the coding of the comparative or independent nature of participants' self-evaluation; although I found these data interesting, I could not see a strong rationale for assigning a maturity-related value to these responses. All of the other codes were used. With regard to evaluation of self, a high evaluation of oneself as a reader was taken as indicative of possible reading maturity. The codes for strengths and weaknesses were summarized as follows: under each overarching category (reading habits, process, purpose, and stance), participants were scored as very strong if they identified two or more aspects as strengths for them, strong if they identified one aspect as a strength, weak if they identified one aspect as a weakness, very weak for two or more weak aspects, and mixed if they identified both strengths and weaknesses in that category. And then any coding of strong or very strong was taken as likely to be indicative or supportive of reading maturity.

It could be argued that having an awareness of one's weaknesses and knowledge of the boundaries and limitations of one's abilities would in itself be likely to indicate greater maturity as a reader. A number of participants invoked this line of reasoning in identifying self-awareness as a possible strength or weakness for them. However, to the extent that participants are presumed to have good self-knowledge and to be accurate in identifying areas where they feel their reading has difficulties or constrains them, then weaknesses as a reader do represent limitations on how much,

how widely, how deeply, how confidently, how openly, or how critically they can read.

Approach to reading. Question 16 of the structured interview was, "Do you approach reading with any particular attitude?" Responses to this question were coded for whether participants described themselves as approaching reading in general with a certain attitude or whether it depended on the circumstances. I also coded for the nature of the approach they described, as related to effort, enjoyment, evaluation, or learning. The coding scheme for this question and examples of the codings are in Appendix L. Interrater reliability for this coding scheme was reasonably good, at 84.2% exact agreement.

I used both of these codings in the reader profiles, as relevant regarding the stance participants brought to reading. With regard to an approach that was general or depends on the circumstances, I coded a general approach as indicative of likely greater reading maturity. I had two reasons for this evaluation. One was that a general response was revelatory of the degree to which the reader's stance was nested in his or her sense of self as reader or was externally conditioned. The other was that a response that "it depends" invoked the type of compartmentalization of reading as for learning or enjoyment, academic or personal that is viewed in this perspective on reading as a possible obstacle to development toward reading maturity.

If readers said that their approach was general, then whatever they said about the nature of that approach was also coded as contributing to a view of their reading status as approaching maturity. However, if they said that their approach depended on the circumstances, that is, that they came to text with different intentions regarding

whether to evaluate, that they tended to expect it to involve more or less work, to enjoy it more or less, or to be expecting to learn or not, I took these responses again to be related to compartmentalization.

Goals when reading. Question 17 of the structured interview was, "What do you aim at when you read? Is it different in different situations?" Responses to this question were coded for the type of goal articulated, including: understand; analyze; share; escape; learn/judge; or answer questions. I also coded for whether the articulated goal(s) related to reading for school or work, leisure reading, or reading in general. The coding scheme for this question and examples of the codings are in Appendix L. I also included a code registering if the participant indicated that their goals in reading depend on the circumstances, but did not use this in the profiles, as that information was already captured by the code for school, leisure, or general.

The other two codes were both used in the profiles. I coded the goals of learn/judge and share as indicative of greater potential for reading maturity across all three possible reading contexts (school/work, leisure, or general). I was interested to see the idea of sharing as an aim of reading emerge in the responses of these participants, and further to see it mentioned in connection with both school and leisure reading. This is a further extension of the idea of reading as communicative, and of the cycle connecting reading and writing.

Understanding seemed like a relatively low-level goal, given the assumed high competence of these readers, and reading for escape in a leisure context or to analyze in a school context both again reflected compartmentalization. The goal of learn/judge implied a deeper and more open form of interaction with the text than

analyzing it; here participants were expressing the aim of coming away from the text with deeper understanding of themselves, of others, of the author, of the author's intention, and with a possible commitment to evaluation and judgment that was of a larger scope. I also coded the goal of analyze as related to reading maturity when it occurred generally or in a leisure context (as indicative of a cross-over phenomenon similar to those identified for Question 10). Interrater reliability for this coding scheme was quite strong, at 96.9% exact agreement.

Knowledge Pre-assessment

Coding. The knowledge pre-assessment was included in order to have some validation of participants' self-reported level of topic knowledge related to the selected passages as high or low. It asked them to give up to five points that they would expect to see discussed in the remainder of the encyclopedia entry of which they were given the first 85-95 words, and to give as much detail as possible. Information from analysis of these data was not used directly in the reader profiles, but did support the generalization across think-aloud and outcome responses as reflecting what readers did in situations of varying levels of knowledge.

I had considered using the degree to which the points participants mentioned actually matched what was present in the full entry; however, the challenges this presented with regard to reliable coding across 27 different passages (and full entries of varying lengths) made this not a realistic option. In addition, it appeared to be very difficult for participants to engage in the imaginative exercise of predicting what would appear in such an old encyclopedia entry and to disentangle what might be likely to be seen there from what they already knew.

I therefore coded these 98 responses (missing the third passage for two participants, as explained in the Methods chapter) for the number of points participants made that were relevant to the topic and at a sufficient level of detail to reveal accurate knowledge, giving one point for each such point made. The range of possible scores was from 0 to 5. In coding the data, I grouped responses (which I had transcribed into separate Word documents) by passage, scoring all of the responses for the Algebra passage as a group, and so forth; this allowed me to think about one type of content at a time, given that there were 27 different possible passages and all were used. I also removed identification of order in which the passage had been seen (which would indicate whether the participant had selected it as a high or low knowledge topic for them).

Examples of the types of responses that got points and those that did not are in Appendix M. For determination of interrater reliability, an independent rater was given 15 randomly selected responses (a little more than 15% of the data), the provided examples, and the beginning entry portions. Exact agreement on assignment of points was reasonably strong, at 80.3 %; differences were resolved by discussion, and tended to involve the independent rater's own level of prior knowledge of the topic, rather than being attributable to a lack of clarity or arbitrariness in the coding scheme as used.

Validation provided. Overall, participants had somewhat stronger prior topic knowledge, as indicated by scores on this assessment, for the passages they identified as higher knowledge for them. Three participants got scores of zero across all four passages, because they did not respond appropriately. Taking out the scores for those

three participants, the mean overall prior knowledge score for the low-knowledge passages was 1.52 ($SD = 1.59$), and for the high-knowledge passages was 2.71 ($SD = 1.66$). There was also an interesting trend with regard to the interaction of knowledge/interest in which, for a given knowledge category (high or low), higher knowledge scores accompanied higher self-rated interest, as shown in Table 5. In general it appeared that participants had gauged their level of prior knowledge with reasonable accuracy, although there were a few cases in which participants had higher scores on their selected low knowledge passages, or in which they had equally low or high scores across all passages.

Table 5
Prior Knowledge Scores Across the Four Evaluative Categories

	<i>Mean Prior Knowledge Score (Standard Deviation)</i>
Low Knowledge - Low Interest (n = 22)	1.27 (1.39)
Low Knowledge - High Interest (n = 22)	1.78 (1.77)
High Knowledge - Low Interest (n = 20)	2.30 (1.69)
High Knowledge - High Interest (n = 22)	3.09 (1.57)

As with all attempts to measure prior knowledge, this measure had its difficulties, including that participants were often simply not given enough information in the initial entry portion to be able to gauge well whether they had high relevant prior knowledge for what they were going to read, or did not consider that what could appear in such an old encyclopedia entry might not be what they were expecting. Additional validation that participants did experience the passages as presenting different challenges with regard to level of familiarity or prior knowledge

came in their responses in the follow-up interview, in which they responded to a question regarding whether they felt they had read all of the passages similarly. A number of them did bring up differences in prior knowledge (and also interest) as having made a difference in how they read, or in their experience of interacting with the passage. In addition, there were evident patterns in the think-alouds and outcome responses across the passages from the four different evaluative categories that indicated that something different was happening for the passages from these different categories.

I did not include an explicit measure addressing validation of level of prior interest. However there were indications both in the follow-up interview and in the think-aloud codings (particularly those for affect/motivation) that several participants manifested a level and direction of interest during reading that matched their initial rating of high or low expected interest, and acknowledged their awareness of such differing levels and directions of interest in the follow-up discussion of their reading experience.

Think-alouds

Coding. The 98 recorded think-alouds were transcribed into separate Word documents, and these documents became the data used in all further analyses. For coding purposes, I removed the identification of passage order, so that I was blind to whether the passage was high or low knowledge and interest for that participant. Because of having so many different passages to be familiar with in going through participants' readings, I grouped the think-alouds by which passage had been read, coding all those for the Algebra passage as a group, and so forth.

I began with an initial set of codes for reading behaviors derived from another think-aloud study of expert readers reading multiple informational texts (Fox, Maggioni et al., 2008). As this suggests, I coded for types of behaviors, which means that the unit of analysis was flexible in size—when what I was reading in the transcript seemed to me like a transition to a different behavior, I marked it off and gave it its own code. Coding therefore also involved chunking up the text into coded units. Everything (except reading aloud, as noted below) was either assigned a code or marked off as non-codable. Only one code was assigned to a given chunk.

As I went through, I added provisional new codes as they seemed necessary in order to capture the behaviors being evoked by these passages. It emerged as I went along that it was helpful to re-organize the overall structure of the coding scheme to align it with the important dimensions I felt were coming out in readers' behaviors with these passages. The initial coding scheme had been organized under two categories: strategic behaviors and monitoring/evaluative behaviors. My new organizational scheme had five major categories: text meaning (behaviors or thoughts related to the mechanics of deriving meaning from the presented text); text characteristics (behaviors or thoughts related to characteristics of the text as a piece of writing); text message (behaviors or thoughts related to the text as a message from an author to an audience or to oneself); task (behaviors or thoughts related to the task); and affect/motivation (expressions or evaluations of affective or motivational response).

After I had gone through all of the data once, I decided which of my provisional new codes seemed helpful and stable enough to be coded, and also

removed codes that had not been used. I also made the decision not to code reading aloud; I decided that any determination of how participants had differently directed their efforts would be blurred by inclusion of reading aloud, given that I could not clearly distinguish when reading aloud was occurring simply as part of their enactment of the task, and when it was being engaged in order to help with understanding. The parsing of reading aloud into different utterances is also problematic, because it is often the case that other behaviors are nested within an episode of reading aloud.

I ended up with a set of 50 codes for 40 different possible behaviors/thoughts (10 evaluative codes split into positive/negative valence determinations), falling under the five categories identified above. The coding scheme and examples for each code are given in Appendix N. Codes under text meaning were: re-reading; reading on; looking ahead; changing rate; guessing the meaning of a word in context; predicting; questioning; marking or annotating; using text element; using dictionary; restating at a local level; restating at a global level; connecting to background knowledge; visualizing; connecting to prior text; interpreting/hypothesizing; elaborating; evaluating comprehension; and reconsidering an interpretation. Codes under text characteristics were: noting text feature; noting text structure; and evaluating text quality. Codes under text message were: arguing with the text; evaluating agreement with the text; evaluating importance; evaluating the argument; considering author intent; considering own intent; connecting to personal experience; and connecting to the context. Codes under task were: connecting to task; evaluating

task completion; and evaluating task difficulty. And codes under affect/motivation were: interest; curiosity; surprise; attention; amusement; liking; and empathy.

To check reliability, these codes were used by an independent rater who coded 10 randomly selected transcripts (a little more than 10% of the data), after being given a copy of Appendix N, discussing the meaning of the overarching categories, going through the coding scheme and reviewing some examples of coded transcripts. The transcripts had been prepared for coding by being chunked up into the coding units I had identified. Interrater agreement was good, at 81.4% exact agreement for code assignment across the entire 50 code set (in a total of 320 codes assigned). This is particularly good given the exclusion of reading aloud, coding of which can often artificially inflate the rate of agreement. Agreement was also strong for category membership, that is, for whether assigned codes fell under the larger categories of the coding scheme, at 97.0% exact agreement for codes under Meaning, 83.3% exact agreement for codes under Text, 86.9% for codes under Message, and 98.0% under Affect/motivation. Task was not quite so strong at 71.4%, but also had the fewest total codes assigned (7). Disagreements were resolved by discussion. This level of reliability was considered to be quite adequate for the purposes for which these data were to be used.

Use in reader profiles. Using these think-aloud data (the assigned codes) in the reader profiles required summarizing them in a way that would capture, overall, what the participants' verbalized thoughts and behaviors during reading revealed about their status with regard to reading maturity. I decided to use participants' averages across all four passages, in order to get at what was going on for them across

the range of reading situations they encountered, and again invoking the idea of consistency of approach rather than high situational sensitivity as possibly indicative of reading maturity.

Of the many possible averages I could have reported, I chose to use participants' average percentage of behaviors across the four passages that were devoted to message and text. Here and elsewhere, averages rather than totals across the four passages were used in order to avoid difficulties related to the absence of scores for passage three for two participants. In calculating these average percentages, I took the total number of codes falling under meaning, message, text, and affect/motivation. Although task-related behaviors and thoughts were interesting, they were also situational artifacts that did not relate as directly to the reading that was going on. The codes under message and text reflected, in my view, behaviors that indicated a high-level, communicative approach to reading. These codes also are aligned with what Gray and Rogers (1956) identified as higher levels of reading competence (evaluative reaction to and use of ideas gained from reading). I distinguished whether participants were high (roughly the top third of the distribution, with more than 35% of their behaviors toward message/text), middle (roughly the middle third of the distribution, with between 21% and 31% of their behaviors toward message/text), or low (roughly the bottom third of the distribution, with up to 21% of their behaviors similarly devoted). Participants who were high in the percentage of their think-alouds devoted to message/text were considered to be more likely to be possible mature readers. Participants with higher proportions of these codes were spending less time working on getting the meaning or on monitoring and reporting

about their own level of motivation or affect, and more time on such behaviors as evaluation, argument, connecting to the text, or considering the qualities of the text as a written product.

The other piece of data from the think-alouds that I put in the reader profiles was the average number of codes assigned (across all four passages). This was used as an indicator of the participant's relative level of engagement when reading the passages. I thought it was important to include this because there was such great variation in how much participants verbalized and in how deeply engaged they seemed to be: the range of average number of codes was from a low of 7.67 per passage to a high of 87.5. In the profiles, I differentiated these roughly by quartiles, as very high (an average of > 59 codes per passage); high (between 39 and 57 average codes); low (between 16 and 31 codes), and very low (between 7 and 12 codes per passage).

Engagement per se does not necessarily indicate greater tendency toward maturity. A participant could be highly engaged but working at very low-level meaning issues. Therefore, to give some sense of a connection of higher engagement in this reading situation with working toward message and consideration of text, I considered high or very high engagement to be indicators of possible reading maturity only if they were also accompanied by scores that were in the high or middle group for average message/text percentage.

Outcomes

Main idea. The first outcome question asked participants to "Look back in the entry and highlight up to five sentences (or parts of sentences) that you would include

in a summary of this entry." In looking at participants' responses, it became evident that these data were difficult to use to generate informative scores. Although responses to this question would under most conditions provide reasonable evidence regarding comprehension, because of the differences across the passage types, this task represented a very different kind of challenge depending on the passage. I had planned to use a structural analysis of each of the 27 passages to identify viable candidate sentences from each for inclusion in a summary. However, in doing such analysis, it turned out that some of the extremely detailed and procedural passages (such as those on Paper and Needle) could basically have been included in their entirety, while other passages had large chunks that were not essential and that should not have appeared in a strong summary. Therefore, although I had intended to use these data as additional validation that these participants were indeed of generally high reading competence (beyond their status as successful graduate students), I decided not to include them as evidence.

Learning. The second outcome question asked participants to, "Please tell in your own words what you learned from reading this entry." The responses were transcribed into separate Word documents for data analysis, and were blinded as to passage order. In figuring out how to score these 98 responses (through a similar iterative process as described earlier), I ended up grouping the types of points they made as addressing four main types of learning: learning what was in the text, learning about the text, learning about the context, and learning from the text. The coding scheme and examples of responses falling under each code are given in Appendix O. Each response was coded for the presence of these types of points, and

multiple codes could be assigned. A subsample of the data (15 responses, or just over 15%) was scored by an independent rater, who used the coding scheme and examples as guidance. Exact agreement on codes assigned was 85.2%, and disagreements were resolved by discussion.

With regard to summarizing these data and determining what they reveal about reading maturity for use in the reader profiles, I once again used averages across all four passages, for the same reasons as given earlier. I calculated the average number of times a given code occurred in that reader's responses across all four passages, for each of the four code categories (where the maximum average could be 1, and the minimum 0). I then further compressed the data by taking the sum of the averages for responses about the text, about the context, and from the text; repeating what was in the text was not included. These averages ranged from 0 to 2.0. I identified three groups in the distribution, those with high scores (1.25 or above), middle-range scores (.75-1.00) and low (< .75). Only a score in the high range was considered indicative of likely possible reading maturity.

Asking readers what they learned from the passage was an intentionally open-ended question that was intended to enable some discrimination between readers who saw this reading situation as one involving the learning of content and those who viewed it as an encounter with an author and with an experience of otherness (e.g., Alexander et al., 2011). The degree to which responses indicated that participants saw some larger potential for learning opportunities beyond simple grasping of what was in the text was thought to be enlightening regarding their participation in reading

as an opportunity for self-development (even in this unfamiliar, constrained and artificial situation, as noted by Säljö, 1997).

Additional analysis of these data beyond what was done here could also explore further the quality of participants' responses regarding what they learned, and therefore give further evidence regarding level of reading competence. In particular, I noticed that some participants' summaries of what they learned did not correspond well to what was in the text, and I was interested to see that this seemed to occur for participants who had in fact mentioned in the interview that they felt that their comprehension was not always good. However, the development of a reliable coding scheme that would support this type of analysis for all 27 possible passages presented a hurdle that I was not able to get past at this time. It was also the case that not all participants chose to provide summaries, so a uniform coding scheme would also have to support determinations of quality for the other types of responses as well.

Reliability. The third outcome question asked participants to, "Please give your evaluation of the reliability of the information presented in this entry." The responses were transcribed into separate Word documents for data analysis, and were blinded as to passage order. In figuring out how to score these 98 responses (through a similar iterative process as described earlier), I ended up grouping the types of points they made as addressing five possible aspects of reliability: agreement, the quality of the argument, the type of discourse, specificity, and bias. The coding scheme and examples of responses falling under each code are given in Appendix P. Each response was coded for the presence of these types of points, and multiple codes could be assigned. A subsample of the data (15 responses, or just over 15%) was

scored by an independent rater, who used the coding scheme and examples as guidance. Exact agreement on codes assigned was 86.5%, and disagreements were resolved by discussion.

With regard to summarizing these data and determining what they reveal about reading maturity for use in the reader profiles, I followed a similar procedure to that used for responses to Question 2. I calculated the average number of times a given code occurred in that reader's responses across all four passages, for each of the five code categories (where the maximum average could be 1, and the minimum 0). I then further compressed the data by taking the sum of the averages for responses related to discourse, specificity, and bias; agreement and argument quality were not included. These averages ranged from 0 to 2.0. I again identified three groups in the distribution, those with high scores (1.25 or above), middle-range scores (.75-1.00) and low (< .75). Only a score in the high range was considered indicative of likely possible reading maturity.

Asking participants to evaluate the reliability of the material presented provided an opportunity for them to bring forward their criteria for evaluation of reliability and to consider how to apply them in this somewhat unusual situation. Using criteria that acknowledged the nature of the discourse situation (i.e., that this was an encyclopedia passage), the limitations associated with specific aspects of the communicative situation (e.g., that this was written at a particular place and time and for a particular audience, and whether that should matter or not), and the possible presence of bias indicated that participants were able to adapt their criteria and create relevant and adequate standards for evaluation of reliability. Gray and Rogers's

(1956) analysis of their comparable question to the selected cases looked at their participants' attitude of inquiry, their ability to suspend judgment, and their use of rational standards (p. 109). Appeal to whether the content is in agreement with one's own prior knowledge is a relatively low-level criterion, and means that one would be helpless to determine the reliability of new content. Consideration of the argument the text presents, although it can address reliability insofar as it takes up issues of author credentials and similar criteria, is a general-purpose reliability evaluation that can be more or less appropriate in this evaluative situation; when it specifically addresses validity rather than reliability it is not appropriate. Therefore, these two types of responses were not included as markers of possible reading maturity.

Presentation. The fourth outcome question asked participants to, "Please give your evaluation of presentation of the material in this entry." These data have not yet been analyzed and are not included here.

Follow-up Interview

In the follow-up interview, participants were asked about their perceptions of the reading experience in which they had just engaged, about whether they felt there had been any differences across the four passages, about any particular goal they may have had in mind while reading, and about any specific type(s) of behaviors I had noted during their think-aloud as being of interest to discuss further. These data were not systematically analyzed nor coded for use in the profiles.

However, it is worth mentioning here that 22 out of the 25 participants did note differences in their reading approach or experience across the four passages that related variously to different levels of knowledge (8 participants) or interest (6

participants), or to some other aspect, such as the nature of the passage as philosophical or factual, biased or objective, or growing familiarity with the task (8 participants). Further, when asked about a specific type of behavior I had noted, such as pausing to summarize for themselves, or consistently giving particular attention to punctuation, 15 out of the 16 participants directly asked about this expressed the perception that the behavior noted (even in this arbitrary and constrained reading situation) did represent a typical reading behavior for them. The one participant who said his behavior was not necessarily typical was not a native English speaker, and he said that the very unfamiliar vocabulary (and lack of access to an on-line dictionary) and difficulty of construction of the text made these passages present an unusual reading situation for him. Both of these are important validations, the one of the reading situation as offering a range of types of experiences, and the other of the observed behaviors as representative of what these competent readers could and would typically do.

CHAPTER V

RESULTS

This chapter presents the results obtained from the data analytic processes outlined in the previous chapter. It begins with an overview of the research questions and how they are addressed in this collective case study design by the three types of results that are forwarded: reader profiles, illustrative individual case studies, and overarching descriptions of reading maturity and reading competence. The reader profiles are then discussed and briefly presented, followed by the fleshing out of these profiles by means of three exemplar individual case studies. The rationale for selection of these individual cases is given, and then the three cases are presented in some detail, as an elaboration of the aspects of higher-level reading development revealed in the data and captured in the reader profiles. Finally, the descriptions of reading maturity and reading competence that are built upon the reader profiles and illuminated by the individual case studies are offered.

Overview

The primary research question addressed in this study is: What does *maturity in reading* from the perspective of Gray's theory of reading development look like when the additional aspects of readers' behaviors during reading, readers' understandings of reading, readers' perceptions of themselves as readers, and readers' performance under conditions of varying levels of topic knowledge and topic interest are incorporated into its description? The secondary, associated question, is: What does *competence in reading* from the perspective of Gray's theory of reading development look like when the additional aspects of readers' behaviors during

reading, readers' understandings of reading, readers' perceptions of themselves as readers, and readers' performance under conditions of varying levels of topic knowledge and topic interest are incorporated into its description?

In order to answer those questions, a collective case study approach was used. This involved identification of appropriate cases of the phenomenon of interest (higher-level reading development), amassing of appropriately informative and varied data for those cases, and theoretically-based and data-sensitive analysis and interpretation of the data to reveal important patterns and themes across all of the cases that were revelatory regarding the larger phenomenon being investigated (Barone, 2004; Stake, 2006; Yin, 2009). This theoretically-based and data-sensitive analysis and initial interpretation of the data resulted in the creation of reader profiles capturing aspects of interest for reading maturity and evaluating participants' relative status for those aspects. These reader profiles, which will be described in the next section, are relatively formalized snapshots of the data that serve the purpose of moving from the individual cases to the phenomenon being observed as instantiated across all of them (Stake, 2006). They allow the detection of cross-case patterns, and set the stage for telling the larger story that is the goal of the study.

However, just because the profiles are highly compressed snapshots, it is also valuable and an important step in the collective case study process to return to the individual cases and validate the applicability of the profiles as appropriately capturing what of most value emerged from the rich variety of data provided (Stake, 2006). For this reason, three exemplar case studies are presented, in order to illustrate exactly what the profile portraits mean when reflected back onto the circumstances of

each individual participant, and to provide some degree of validation that these profiles represent a true and unforced coming together of theory and data. Gray and Rogers (1956) used this type of detailed analysis to elaborate and substantiate their conclusions regarding the nature of reading maturity, and offered a subset of eight of these elaborated portraits chosen as exemplifying particularly salient aspects of the conclusions they reached, while also incorporating supplementary and additional evidence from other individuals' data where necessary or helpful.

The final part of the results is the direct answer to the research questions: the descriptions of what reading maturity and reading competence look like, based on the theoretical perspective driving this investigation, when all of the types of information gathered about these readers are taken into account, as summarized in the reader profiles and elaborated in the individual case studies. An important aspect of these descriptions will also be to identify whether and how they move beyond what was seen earlier by Gray and Rogers (1956) as a result of incorporating the types of additional data obtained. Such a description is the aim of a collective case study, which seeks to present conclusions about the underlying phenomenon that are drawn from the observation and analysis of the multiple cases (Barone, 2004; Stake, 2006; Yin, 2009).

Explicit attention will be given in presenting the results to following the criteria for exemplary case study research. In particular, the argument here for the profiles and then also at a higher level for the descriptions developed will seek to establish the reality, relevance, and likely stability of the patterns observed, and to identify and address competing explanations or counter-arguments (Yin, 2009). The

other key argument relating to issues of generalizability and utility (Yin, 2009) will be addressed in the following Discussion chapter.

Reader Profiles

The 25 reader profiles that were created from the data analysis process described in the previous chapter are given in Appendix L. The meaning and rationale for the codes used, the evaluative criteria employed, and the decisions regarding which data to include were presented on a case-by-case basis in the previous chapter. The aim of discussing the profiles here is to address how the profiles are used, and to bring together in one place a description of all of the markers of maturity that were identified and that are represented in these profiles, so that the nature of the patterns that they can reveal by their separate or conjoined presence is made clear.

In creating the profiles, each type of data was treated independently, and a separate coding scheme and scoring determination made for each; these decisions were consistently guided, of course, by the underlying perspective on reading, but making them did not involve bringing together different types of data and considering how they might move together. The profiles therefore have the relatively static and pieced-together character of a mosaic. However, what they collectively allow to shine forth makes them very powerful with regard to the goal of this study, which is the investigation of the underlying phenomenon presumed to be giving these collective data their shape: higher-level reading development.

It is critical to bear in mind that the profiles do not represent absolute evaluative determinations regarding individual participants. Every coding scheme

developed pulled out only what worked across the group, and was therefore leaving behind a lot about each individual. Further, the determination of evaluative categories for each coding scheme was in most cases relative to these data, intended to highlight what was at the "top" in a way that would enable looking across the data and across participants. In addition, the responses to the open-ended questions in the structured interview and the thoughts and behaviors verbalized during the think-alouds are only samplings of what occurred to that participant; they do not reflect the possible breadth or depth of what participants might have said under conditions of more systematic probing. That the participants did think to say or do something spontaneously in response to these questions and tasks is strong evidence, while that they did not say or do something is a much weaker statement. For these reasons, what is being studied via these profiles is the phenomenon as evident across these collective cases, and not the individual variations per se.

It is also important to emphasize that what is seen in the profiles reflects very specifically what was present in the data. Although there was a theoretical perspective guiding the analysis, it was not just a matter of seeing what I came looking for. For example, if very few or no participants had regularly engaged in think-aloud behaviors related to author or message, as our studies of undergraduate reading behaviors have shown to be possible (e.g., Fox et al., 2007), that would not have been a possible marker for maturity. What is in the profiles represents a confluence of theory with what emerged in these data from these participants as a collective.

The profiles present dimensions along which participants varied with regard to aspects possibly relating to reading maturity, based on Gray and Rogers (1956), as well as on more recent theoretical and empirical work related to reading expertise and reading competence (as outlined in the Methodology chapter). Table 4 in the previous chapter gives the alignment of data collected, construct addressed, and how it was represented by the coded data in the profile. The profiles highlight the presence in the different types of data collected of indications of possible reading maturity. Most immediately, the profiles allow the skimming off of what emerged as at the "top" of the data; the story of which of those might tend to emerge together and why is the description of reading maturity that will be presented in a subsequent section.

The profiles begin with the reader characteristics of age, years of graduate experience, and area of study. Being older than 31 years old (which singled out 8 participants), having more than 4 years of experience with graduate study (10 participants), and engaging in an area of study that focuses on author-oriented text analysis (2 participants) were all taken to be indicative of possible reading maturity. The aspects of early background as a reader that were highlighted in the profiles as signaling possible reading maturity were mention of the memory of their experience of learning to read as associated with ease (10 participants) or enjoyment (13 participants), and occurring in or connected for them with an out-of-school context (17 participants). Indications of reading maturity noted in their reported experience of reading in school (from elementary school through college) were the memories of their experience in school as associated with exclusively positive affect (12

participants) and including some kind of exposure to (typically literary) in-depth text analysis related to how authors use language to create meaning (16 participants). With regard to out-of-school experience (over the same time period), the identified indication of reading maturity was the inclusion in their response of suggestions of the merging of reading for enjoyment and reading to learn, in-school and out-of-school reading, or reading fiction and nonfiction, without the corresponding presence of suggestions of a view or experience of these as distinct or compartmentalized (10 participants). The final aspect of reading background taken into account was participants' judgment of whether they had changed as a reader over time, with positive change taken as pointing toward possible reading maturity (15 participants), but only where such positive change occurred in reading habits (7 participants), effectiveness in accomplishing reading purposes (6 participants), attitude toward reading (3 participants), or perspective on reading (3 participants).

The next major area addressed in the profiles is current status as a reader. Reporting spending more than one hour a day on personal reading as a regular habit was taken to be associated with possible reading maturity (7 participants), as was choosing their reading from among three or more different text types (12 participants). Expressing very high, unconditional enthusiasm for reading (10 participants) and identifying self-development as a reason that reading was important for them (13 participants) were the other two indications of reading maturity related to current reading status.

Participants' understandings of reading make up the next group of characteristics presented in the reader profiles. Possible maturity as a reader was

signaled by the mention in their descriptions of what goes on for them during reading of the experience of effortful engagement and thoughtful reflection or analysis when reading fiction (9 participants), of flow or ease or effortless immersion when reading nonfiction or for work (7 participants), and their awareness of the presence of an author, either directly or through mention of the experience of reading as conversational or argumentative (5 participants). With regard to their descriptions of what it means to be a good reader, possible reading maturity was linked to mention of reading for the message of the text (15 participants), being able to reach one's reading goals (4 participants), having an attitude of enjoyment or confidence (4 participants), or breadth and amount of reading (4 participants).

The final portion of the profiles that draws upon what readers said about themselves as readers is concerned with self-perception as a reader. Having a high perception of self as a reader was thought to indicate likely reading maturity (8 participants). Identification of reading strengths not undercut by weaknesses in the same area was another aspect of self-perception thought to indicate likely maturity, with the broad areas of reading covered by participants being reading habits (7 participants), reading process (6 participants), reading purpose (11 participants) and reading stance (9 participants). Participants who described their approach to reading as general (13 participants) and as aimed at enjoyment (6 participants), learning (7 participants), effortful engagement (3 participants), or evaluation (2 participants) were considered more attuned to the perspective on reading adopted here, and therefore more likely to be at or moving toward reading maturity as viewed from that perspective. Finally, participants' goals when reading were considered. Having the

goal of sharing when reading for school (6 participants), when doing personal reading (1 participants) or in general (2 participants) was thought to be associated with reading maturity. Similarly, the goal of interacting with the text to arrive at larger learning or a judgment when reading for school (2 participants), doing personal reading (6 participants), or in general (4 participants) was taken also as a marker of reading maturity. The goal of reading to analyze text when doing personal reading (1 participant) or in general (1 participant) was also seen as indicative of possible reading maturity.

The last part of the profiles concerns what participants said and did during reading, and what they took away from their reading experiences. Readers for whom more than 33% of their coded behaviors, on average across all four passages read, were related to interacting with the message of the text or consideration of the text as a written product were thought to be showing possible reading maturity (9 participants). Level of engagement with the text, as indicated by average number of coded behaviors across all four passages, was thought to relate to possible reading maturity when a relatively high level of average engagement (39 coded behaviors per passage or more) was associated with either a mid-level (between 21% and 31%, 3 participants) or high (more than 35%, 4 participants) proportion of behaviors devoted to message or text. Finally, participants were considered to be showing possible reading maturity if what they identified as learning from the texts included, on average, more than one of these possible types of learning: learning from the text, about the text and its author, or about the context (as indicated by an average sum of 1.25 or greater). They were similarly considered to be showing possible reading

maturity if their evaluation of the reliability of the material presented in the passages included, on average, more than one of these possible aspects of reliability indicating the development of specific criteria for this reading situation: discourse type, specificity, and bias (as indicated by an average sum of 1.25 or greater).

Exemplar Cases

Three exemplar cases were chosen for closer inspection in order to give a sense of how the profiles were working in highlighting patterns in the data, as well as a sense of what emerged when looking beyond the dimensions addressed in the profiles. Frances was chosen because her profile shows the greatest consistency in manifestation of possible indicators of reading maturity across all of the different data types. The other two cases were chosen as also having a relatively high number of markers of reading maturity, and more specifically as illustrating particular theoretically-justifiable patterns of higher-level reading development in the form of reading competence that are differentiable from reading maturity. Frederick exemplifies the adult reader with high general skills and cross-situational success. Benjamin appears to be a strong example of an adult reader who is going down the path of expertise and encapsulation, here in the domain of literary analysis.

The procedure in presenting these individual case studies will be to walk through the participant's responses for each of the major areas making up the profiles (the profiles for each of the three exemplar cases are given in Table 6), illuminating and illustrating what the coding meant in terms of participants' responses and in terms of what else their data had to show. In this way, we will take a look at each of these participants' stories of themselves as readers, what they said and did during

reading, and what they came away with from these texts. This will enable us to consider more closely the nature of higher-level reading development as revealed in these data, as preparation for the final element of the results, the descriptions of maturity and competence.

Frances: "I am fearless." Frances did not stand out as of likely high reading maturity based on her reader characteristics: she was in the younger age group, at 27, had a moderate level of graduate school experience (3 years), and was studying Botany, not an area of study associated with author-oriented text analysis. This suggests that perhaps these reader characteristics, although theoretically justifiable, may not be particularly strong or helpful as signals of possible reading maturity in the absence of other data.

Her early reading background lined up exactly as indicating the type of positive and out-of-school experience thought to be related to reading maturity. In reporting her memories of learning to read she spoke of how "it was very exciting for me," and about "being very excited riding in the car, being able to say what was on the signs that we were passing." Her description of her school experiences with reading included mentions of both positive and negative affect, speaking of liking to help other people, and liking the reading that was being done all through her years in school, but also "being annoyed at the kinds of questions they asked us in class about the reading assignments that we had...I just wanted to start reading and figure it out," with this annoyance surfacing for both elementary and high school classroom reading experiences.

She described in detail having had the type of strong and extended experience with doing intensive text analysis thought to support likely reading maturity, both in her high school classes in an International Baccalaureate program, and also in her college-level classes. She spoke of it as a kind of training, "looking very closely at words" in the case of her high school experience, and "we were looking more at, I guess, how people express complicated ideas" in the case of her college level classes. She repeatedly described reading across the boundaries of school and personal reading, doing further reading on her own to explore areas that interested her that she had encountered in school, beginning in high school and continuing on into college.

She said, with regard to her personal reading in college, in which she delved deeper into works by authors who were among her assigned readings, "I was always curious to see what else, what other kinds of things did they have to say, what were they talking about."

She identified change for her as a reader in relation to reading habits, which had changed in what felt to her like a moderately but not disturbingly negative direction. She said that she did not read as much when she had free time as she remembered that she used to do, that if she picked up a book, it was harder to put it down and come back to it—she would want to go ahead and finish it, and that reading was not necessarily her first choice of what to do when she had free time, given the other competing activities and forms of entertainment she had available. She said, "It's like a nice hobby, but in my free time, I have other things that I have to take care of and it's not my first choice for entertainment. So, that has definitely changed."

Table 6
Profiles for Exemplar Cases

Frances

Reader Characteristics:

Demographics: Age Younger (27) | Experience Moderate (3 Years) | Area of Study Botany

Reading Background:

Experience of Learning to Read: **Ease** | **Enjoyment** | **Out-of-School**

School Experiences: Affect Mixed | **Text Analysis** *Out-of-School Experiences:* **Merging**

Change as a Reader: Negative | Aspect = Reading Habits

Current Reading Status:

Current Leisure Reading Habits: Hours Daily Regular (1) | Text Types **High (3)**

Interest/Importance: **Very High** | Escape, Professional, **Self-Development**

Understandings of Reading:

During Reading: Cross-over **Non-fiction** | Author **Present**

Good Reading: Efficiency/Understanding, **Message, Attitude**

Self-Description as Reader:

Self-Description: **High** | Reading Habits **Very Strong** | Process **Very Strong** | Purpose Weak | Stance **Strong**

Approach: **General** | Aspect = **Learning**

Goals: School/Work: Analyze, **Share** | Leisure: **Learn/Judge**, Answer Questions | General: Understand, **Share**

Task Performance:

Think-aloud Behaviors (Means): Message/Text **High (39.4%)** | Engagement **High (48.25)**

Outcomes (Means): Learned **High (2.0)** | Reliability **High (1.25)**

Bold = Coding indicating possible reading maturity; NR = No response

Frederick

Reader Characteristics:

Demographics: Age **Older (34)** | Experience **Very High (7.5 Years)** | Area of Study Ecology

Reading Background:

Experience of Learning to Read: **Ease** | **Enjoyment** | School

School Experiences: Affect Mixed | **Text Analysis** *Out-of-School Experiences:* Merging, Separation

Change as a Reader: **Positive** | Aspect = **Effectiveness**

Current Reading Status:

Current Leisure Reading Habits: Hours Daily **High (4-6)** | Text Types **High (3)**

Interest/Importance: **Very High** | Practical, Professional, **Self-Development**

Understandings of Reading:

During Reading: Cross-over **Fiction, Nonfiction** | Author NR

Good Reading: Efficiency/Understanding

Self-Description as Reader:

Self-Description: **High** | Reading Habits Mixed | Process **Strong** | Purpose Mixed | Stance NR

Approach: **General**, Depends | Aspect = Enjoyment, Effort, **Learning**

Goals: School/Work: NR | Leisure: NR | General: **Learn/Judge**

Task Performance:

Think-aloud Behaviors (Means): Message/Text **High (48.1%)** | Engagement **Very High (69.75)**

Outcomes (Means): Learned Middle (1.0) | Reliability Middle (1.0)

Bold = Coding indicating possible reading maturity; NR = No response

Benjamin

Reader Characteristics:

Demographics: Age Younger (25) | Experience Moderate (2.5 years) | Area of Study **English**

Reading Background:

Experience of Learning to Read: **Ease** | **Enjoyment** | **Out-of-School**

School Experiences: Affect **Positive** | **Text Analysis** *Out-of-School Experiences:* Merging, Separation

Change as a Reader: Negative | Aspect = **Lens**

Current Reading Status:

Current Leisure Reading Habits: Hours Daily Low (< 1) | Text Types Low (1)

Interest/Importance: Moderate | Professional

Understandings of Reading:

During Reading: Cross-over **Fiction, Non-fiction** | Author NR

Good Reading: **Message**

Self-Description as Reader:

Self-Description: **High** | Reading Habits NR | Process **Strong** | Purpose NR | Stance Mixed

Approach: **General** | Aspect = **Learning**

Goals: School/Work: NR | Leisure: Escape | General: **Learn/Judge**

Task Performance:

Think-aloud Behaviors (Means): Message/Text Middle (28.3%) | Engagement **Very High (71.5)**

Outcomes (Means): Learned Middle (.75) | Reliability **High (1.25)**

Bold = Coding indicating possible reading maturity; NR = No response

Frances reported that her reading of science journal articles for school was interesting and exciting, and that she engaged in regular reading on her own time as well, about an hour per day. She read a variety of types of materials in her personal reading, including magazines (*Granta*, *Paris Review*, *Science News*), books from the library, short story collections on her Kindle, cookbooks, and online reading of news and web comics. In her later response about reading interests, she mentioned enjoying reading fiction, "normal stories" as well as magical realism and fantasy, and also history, which is "just another kind of story," and autobiographies. She reported that she was "very interested" in reading, and prefers learning from reading to other formats. She felt that reading was very important for her, mentioning (as did quite a few other participants) the tension encountered in having to read many journal articles for school between wanting to read them in print and not wanting to go through the expense and paper of printing them all out. She went on to say that, "being able to read for myself is also important. It's a good way of, I don't know, I feel like I'm doing something, um, like I'm not wasting time...And yet, it is entertainment." The sense of (certain types of) personal reading as inherently productive and beneficial was reported also by a number of other participants, which is an interesting shared perception of personal reading surfacing among these adult readers embedded in academics.

When Frances described what she does during reading, she described a very careful and effortful evaluative processing when reading technical materials, but also a cross-over experience that she had with reading a handbook on paper-making and pulp-making, which was relevant to her area of research. This experience was more

like pleasure reading for her: "It's a technical sort of work, I would expect it to feel very heavy, and like I'm doing a lot of work. But it's a textbook, so it's like a lot of definitions, and walking you through the construction of different machines, and so that is very easy, and I find I'm reading it more like a pleasure book... So it's actually something I look forward to reading, is the handbook of pulp and papermaking."

This type of reading-related experience of the merging of academic interest and personal interest speaks very directly to the development of domain expertise and how it can be connected with development as a reader.

When asked if she knows anything about reading, Frances spoke about differences for different people, about automaticity of word identification and not being able to turn it off, and how being a fluent reader means that you no longer feel as though you are interacting directly with the letters on the page. She also revisited this question in the follow-up question at the end of the interview, and spoke about how reading and writing are interconnected, mentioning specifically that she grades undergraduate lab reports, and that students' deficiencies in writing these seem to her to be very clearly connected with their lack of experience in reading this type of writing.

When asked what it means to be a good reader, Frances's first response was, "I think it means—being sort of fearless and confident. I think a good reader is one who can say, oh, I will read this, and I will get something out of it, and it will be something the author meant me to get out of it." She also mentioned being critical and evaluative, "to be able to say, this writing is bad... Being able to judge that what they're saying just doesn't make sense, and it's not my fault that I'm not understanding

it, is important...there is a critical aspect to it, where you can read it, but not actually admit it into your thinking." She also said that comprehension is the foundation of good reading, along with confidence: "you can't get hold of the wrong end of the argument." She characterized being able to know whether you have understood or not as "tricky" and "interesting," and was not sure how that happens, but in her experience felt that she is rarely wrong when she thinks she has understood something properly.

"I am a good reader. I am fearless," was Frances's first response to the question about self-description as a reader. However, she said she does not always enjoy arguing with the author, although there are times when it is necessary. Along with being fearless, Frances described herself as "curious" and "interested in reading anything. I'll pick it up and try it, at least, even if it's something totally outside my subject knowledge or experience." And finally, she said that she was proud of feeling this way about reading, and thought everyone should. She amplified on this by bringing up the idea that once she had taken on a challenging reading and understood it, she would "tell it to you, and then you will be able to understand it," although "if everybody understood it on their own, that would be fine, too, to be able to just talk about it directly." So the idea of reading in order to share ideas with another, both in the text and then after reading, was strongly present in Frances's understandings of reading. Other strengths that Frances felt characterized her as a reader were being good at "untangling syntax" in complicated sentences or even paragraphs, and at arguing with science journal articles that she is reading for school, although she has a harder time being able to say whether she likes the argument or agrees with it for

other types of text, such as philosophy. She saw herself as being a fast reader, and as grasping everything as she goes with little difficulty.

Frances said that she does not feel that she approaches text with any particular attitude or frame of mind when reading, although she reported also a general impatience and eagerness to find out where they are getting and what is the point. She described a general sense of "wanting to know what's going on" even when reading for entertainment, the idea that "there's always something behind the story, it's not just for plot, or, like, pure entertainment, or, that's the wrong word, that's too vague, but I like there to be something else to it." With regard to her aim in reading, she said that she generally aims at comprehension, and likes "to be able to tell what I've read to somebody else...It helps me figure out what was going on, and it helps me feel like it was a useful exercise, or, you know, it had some purpose beyond just reading it." She mentioned that in her personal reading, she is sometimes reading to find explanations for things, and she likes it when her leisure reading has more to it, "there's something more about, like, man's condition that's behind it, and that I like to think about. So I like to comprehend stuff, and then also be able to think about it more...And usually if I'm reading stuff for fun, I can do that." For her school reading, she referred again to the idea of sharing, along with the need to unpack what is in the text.

The four passages Frances read were on Potatoes (LK-HI), Anabaptists (LK-LI), Algebra (HK-LI), and Fire (HK-HI). Her prior knowledge scores were highest for Potatoes and Fire (both 5), with a 2 for Algebra (for which she only listed 3 points), and a 3 for Anabaptists. Her think-alouds were active; she engaged in a

variety of behaviors related to meaning-derivation across the four passages, but also consistently attended to text characteristics and was strongly critical of text quality for the passages on Potatoes, Algebra, and Anabaptists. She consistently interacted with the message and the author, considered the context, and argued with the text. She tended to enjoy the reading, expressing amusement and liking while reading every passage.

On the after-reading tasks, Frances reported learning material that was in the text for every passage but Algebra. She also reported (for every passage but Potato) learning that related to gaining a new idea or new way of thinking, or connecting the text more directly to her own ideas and experiences, which has been identified here as learning from the text. For example, she wrote for the Algebra passage, "I find it much clearer to proceed from examples, discussed specifically, and thus to arrive at a generality." In addition, she learned about the text and its author for the Anabaptist and Algebra passages, writing about the Anabaptist passage in relation to author intent that, "It is very important to Smellie (ed.) or to the Anabaptists who submitted the text, that they are an obedient, law-abiding people, and their views on baptism and religion don't interfere with their role as citizens." Finally, she noted that she had learned something about the context for the passage on Fire, writing "fire, temperature and heat were not yet fully described at the time of the encyclopedia's writing." When she evaluated the reliability of the material presented, she noted for every passage some aspect of specificity or narrowness of scope that would condition the generalizability or stability over time of how this material could be reliably used.

She also noted bias for the passage on the Anabaptists, and mentioned aspects of the argument being made for her high interest passages on Potatoes and Fire.

In her follow-up interview, Frances reported responding to the passages differently because of differences in the passages themselves, "the passages themselves had a sort of different character...because of the topics that they were about." Although she began by trying to read them all the same way, each one took a particular tack in how to go about being an encyclopedia entry, and she found herself responding to that once she was able to identify what was going on: "at some point, it became different, just when I realized, like, oh, that's, this, it's going into this level, or it's this kind of thing they want to present." She said that her goal in reading was just curiosity and interest to see "just what they thought about these subjects at that time" and also "trying to see how well their knowledge held up, so if what they were saying agreed still with what we are saying today, which goes along with the curiosity, because that's how you measure what they're saying at all."

I asked her about her evident attention to terms and definitions in each passage, and whether that was typical of her reading. She felt that it was fairly typical, and that finding the boundaries of the definition was a way to "get at what someone is saying," because "there's something apart from the words themselves that encapsulates what they're trying to say, and so, trying to find the boundaries of the definition helps you, figure out what, what that is." She felt this was true for all types of writing, and was a general approach that she used. And her final comment was that she has a hard time separating reading from thinking, although they are clearly

different and we have different words for them, but that the experience of thinking-aloud made her wonder when it was thinking and when it was reading.

Overall, this portrait of Frances reveals a reader who is reflective, interested, independent and confident as a learner, oriented toward learning from her reading, open and curious to extend her understanding of the world and of others, undaunted by unfamiliar topics or types of text, who is able to read closely, carefully, critically, and with enjoyment, who brings away from her interaction with the text new thoughts and ideas, reflections on her interaction with the author, and awareness of contextuality, who finds it a natural continuation of reading to extend her communicative interaction by further sharing and discussing what she reads, and who brought away from this reading experience new thoughts about reading itself.

Although Frances did not perfectly match the "ideal" mature reader who would respond only in ways that would be scored for the reader profile as indicating reading maturity, her profile and other data consistently indicate that her approach to reading, view of herself as a reader, understandings of reading, active and reflective interaction with text, and enthusiasm for reading would support her continued and developing engagement in competent reading for self-directed growth through her communicative, collaborative, interpretive, and evaluative encounters with text.

Frederick: "If it's in a book I can read it and get it and then it's mine."

Frederick was among the older and more experienced participants, at 34 years old and with 7.5 years of graduate school experience. His area of study, Ecology, again did not involve the author-oriented text analysis thought to be connected with likely reading maturity. From a developmental point of view and with regard to the

suggestion that graduate study itself can promote a more mature orientation toward reading, therefore, Frederick appeared to be a strong candidate for reading maturity.

Frederick's memories of learning to read were associated with thoughts about children's books, and he recalled learning to read as connected with ease and enjoyment, and with the specific book he used in his kindergarten class at school. He described his elementary school experience of reading as having involved frequent frustration and boredom, and feeling restricted by his teachers, who did not acknowledge or did not accommodate for the level of reading of which he was capable. He spoke of the introduction of informational textbooks and how that made school reading become a trudge and hard to get through, that this was a "different type of material than what I read for fun." High school continued to be frustrating for him, with the experience in English classes of having to read in chunks what he wanted to gobble up and read straight through, but he also then got recognition for being a good reader, and the feeling that this was a valued skill. In college, he described the continuation of what he called a "textbook mentality," of disliking the school reading and finding it to involve tiresomeness and work, "I was reading much more textbook, uh, reference material... which are dry and present information that I'm interested in, but they present it in a textbook-y way, that I guess I just associate this with, ugh, this is boring." He remembered having had an encounter with text analysis in a summer class for gifted students, and learning there about the close attention to how the text is presented that informs literary analysis, "even the way it looks on the page can be important."

When describing his experiences with reading outside of school during this same time period, Frederick emphasized the genuine pleasure that he found in the avid reading that he did in his free time, as distinct from the work-like reading for school. However, he also mentioned that besides that aspect of pleasure, he also sought challenge and growth in his personal reading, "At a certain point I started to seek out, to deliberately try to read books that were challenging or outside of my comfort zone...and more often than not, finding that I did enjoy it and was able to get through it...broadening my idea of what would be a fun way to read in my own time."

Frederick identified a positive aspect in which he had changed as a reader over time, which was that from graduate study and the reading of scientific journal articles that this entailed, he had mastered a whole new process of reading, at which he was not particularly adept in the beginning. He had to consider what this type of reading involved that was new to him, and train himself to "chew on it in a much more methodical way and think really hard about the words," as opposed to his usual rapid and effective pass-through of the text that was more than adequate for other types of reading.

Frederick reported spending a considerable amount of time every day reading, four to six hours per day including the time he spent reading online. He read magazines, different types of fiction such as science fiction, fantasy, and mystery, and nonfiction such as accounts of historical events. His regular online reading, which occupied much of his free time, included keeping up with current events and reading sports blogs. Although he felt that his personal reading was primarily oriented toward fiction or entertainment, he noted that, "I still do try to challenge myself every so

often by picking up something that's hard, that I know is going to be more work for me to think about," in which category he included both reading of nonfiction informational books and reading of challenging literary works. Frederick reported that he was "tremendously interested" in reading, and felt that he either directly enjoys reading or knows that he benefits from it in ways that are real and recognizable. He gave reading "the ultimate importance, " both because it "underlies almost everything that I spend, that I do, both in and out of my job," and because " it is the single biggest important thing in education or in intellectual development that there be a lot of reading, because it's the best way to gain vocabulary and learn language and learn subtleties of language, subtleties of argument." He spoke of reading as professionally important, for growth of knowledge in his area of study and in order to be able to participate in the discourse of his academic community. Reading was also important for his day-to-day functioning, finding out how to address problems and solve them.

In discussing what happens for him during reading, Frederick described the cross-over experience of becoming engrossed in nonfiction, "when I try to make myself read history, sometimes I get engrossed in it." He also spoke again of reading challenging literary text, and how that might involve work, "Fiction is never work unless it's like experimental, crazy fiction." But on the whole, when reading involved work, Frederick typically associated this with it being boring, and felt that his reading for pleasure was more passive, "I'm putting something in front of my face, and I'm looking at it, and I'm getting stories."

What Frederick described as his knowledge about reading related to his understanding of the developmental process of learning to read, the idea of building blocks that involve taking bigger and bigger pieces of information, starting with letters and sounds. He was particularly interested in this idea because it was for him a useful analogy to other forms of development he studied in Biology and Ecology. He described the nature of good reading by considering his own capabilities as a reader in comparison to those of other types of readers among his immediate circle. He considered himself skilled, in that he reads fast, has a great vocabulary, and can take in and understand text content very adeptly. But he also identified another type of good reading, which involved a more methodical approach, registering all of the details, digesting, and learning thoroughly. "So I think that I am good at reading in a way that is not methodical. But I also think that being methodical is good for a different reason." Both of these forms of good reading for Frederick were about learning what the text presented.

As noted in his response about good reading, Frederick considered himself to be a skilled, good reader. He reads very quickly and does a good job of understanding the ideas and themes, getting the intent and also much of the detail, but sometimes misses important details, "I sometimes leave pieces behind in my haste." He felt that his attitude of dreading certain types of text and seeing them as like work was a weakness, but also that he does genuinely look forward to and enjoy pleasure reading. He reiterated his sense that this was his consistent attitude in the follow-up interview at the end of the second session: "in my development of reading through

high school and college, that difficult reading that challenged my brain and made me work, got lumped in with homework and assignments, and it's still a little that way."

In the follow-up question at the end of the interview, Frederick further amplified on what he considers to be his strengths as a reader, bringing up what for him was the important point that he feels he has particular skill in rapidly understanding new concepts, "If you give me the book on how to do it, I can get it and do it, so I feel like my ability to get to a point of mastery of a topic is very powerful, and I feel very confident." The idea of the power and scope of this capability of getting what is in books he repeated by saying, "Nothing is really beyond my understanding"; "If it's in a book I can read it and get it and then it's mine and I can use it."

With regard to his approach to reading, Frederick said there were aspects that would depend on what he was reading, and that sometimes he is expecting to exert more effort and that he will have to do some work, while for pleasure reading he anticipates a relatively unproductive but deeply enjoyable experience. On the other hand, he also said that in general, he thinks of reading as, "like being on a shopping spree... There's so much in there! And I can have all of it, if I want!" Books for Frederick were "tools" that give access to "the capability of everything that's in those books, you just have to crack it open and take it out." When discussing his aims in reading, Frederick again reported a general acquisitiveness, in the sense of "acquiring ideas and conversations and characters... I'm collecting ideas. I build, and then I have a big reference source, that when I read more things, I can have a bigger background to compare them to." He gave as an example reading G. K. Chesterton's *Father*

Brown mysteries, and thinking about what he learned from those about the "type" of the gentleman detective that he could add to what he already knew about that type from his other readings of mysteries.

The four passages Frederick read were on Mechanics (LK-HI), Parents (LK-LI), Potatoes (HK-LI), and Silk (HK-HI). His prior knowledge scores were uniformly high, at 5 for every passage. He showed very high engagement across all four passages, with consistent strong attention to the text. He also consistently considered author intent in writing and his own intent in reading, moving back and forth between thinking about what the writer was trying to do in constructing or framing the text and what his own stance was in reading. This interaction was not so much conversational, and did not typically involve arguing with the text, but was more about the task of the writer tackling this writing challenge of creating an encyclopedia entry (for a particular audience). He also attended to text structure and to evaluating the importance of different parts of the text. He expressed positive interest, amusement, and liking for all but his low knowledge and low interest passage on Parents.

On the after-reading tasks, Frederick's responses regarding what he learned from the text included a report of what was in the text (in the form of a well-organized summary overview) for all four passages. He learned about the text and its author for all passages but the one on Mechanics. An example of this type of learning is his critique of the passage on Potatoes, which he offered before his summary overview: "This entry provided a lot of detail about how potatoes should be grown and managed. It was detail-rich and definition-poor." For the Mechanics passage, he

reported also learning something new from the text, "The experiment with the candle in the sealed container is new to me, and I want to remember this for future classroom demonstrations."

In his evaluations of reliability for the four passages, Frederick invoked different criteria each time, considering agreement and the quality of the argument for the Mechanics passage, the type of discourse and agreement for the passage on Parents, the quality of the argument, the type of discourse, and specificity to a particular context for Potatoes, and context-specificity and agreement for Silk. For example, for the passage on Silk, he noted, "The reliability of the more practical information is dubious, if only because specifics about what kind of silk is best are sure to become outdated very quickly."

In the follow-up interview, Frederick reported that this had been interesting as an experience of reading, but was probably not representative of his typical reading, because it involved for him thinking about "differences between language and the types of things they chose to say and the ways in which they chose to say them in seventeen seventy as opposed to now" and also trying both to understand what was being said and to think about his own thinking in order to report it aloud. He noted progressive differences across the four passages, in that he felt that he was checking on patterns he was identifying as he went along, such as the use of semicolons or the organization of the text. He was trying to see how they were going about this writing of encyclopedia entries, so that "by the end, I had things I was keyed in on, and I was looking for examples of those things...look, they jump from big concepts to really fine details, oh, look, they did it again in this entry...that seems to be a common flaw

in early attempts at writing encyclopedias." He felt that, "By the end, I think I had sort of crystallized an idea about what an encyclopedia entry should be, which I didn't have a concrete idea of going in. I mean, I clearly had an idea, but I couldn't necessarily have described it. By the end, I think I had at least figured out where some of the boundaries of that idea were." He said that he had no particular goal in mind beyond doing a good job at being a participant.

When I asked about his behavior of considering the structure of the text in relation to its aim of being an encyclopedia entry, he said that type of consideration is typical of what he does when reading (although not in pleasure reading), and that he felt it was something he had been trained to do in reading and evaluating his own writing and the writing of others, primarily in his graduate level experience, so that "now I think I do it as how to be a good critical, I guess, it's critical reading, when I do critical reading, that is what I do." He noted seeing bias and regionality in the passages, and how interesting it was to notice in himself that he was affronted or surprised to see that, as reflecting his own expectations of a more scientific or objective approach in informational text. And he also reported noticing that he had the same avoidance response toward something that appeared work-like and undesirable that emerged in his descriptions of his attitude toward school-related reading, toward the writing that he was asked to do in completing the outcome tasks.

In this portrait of Frederick, we see an adult reader with general high competence across reading situations; he can clearly read and understand what is presented in text even when the material might be difficult, unfamiliar, or uninteresting. He identifies himself with reading, enjoys and values reading, and has

acquired considerable knowledge from reading. However, he demarcates reading into the realms of academic and personal reading, in-school and out-of-school, work and pleasure. He separates more passive reading for pleasure and enjoyment, and typically effortful "schoolish" reading to acquire knowledge (both for academic purposes and for his own love of acquiring knowledge). Although he challenges himself as a way to push his reading boundaries and expand his reading skills, and does express a general desire to learn and obtain knowledge, his approach to reading and his understanding of what reading involves is not open and conversational—he is interested in what he can acquire, not in transforming his understandings of himself or of others. His somewhat technically-oriented approach to text is clearly a strength insofar as it enables him to rapidly assimilate different types of initially unfamiliar texts and text purposes, which then becomes further knowledge that he can bring to bear in subsequent reading situations. However, his attention to the text has the character of being attention to the text as the product of a writer who is trying to accomplish a particular writing task; the author is not there for him as a person with whose ideas he is engaging. Although Frederick has gone very far with reading, he also has self-acknowledged limits in his approach to reading and his understandings of reading that keep him at the level of high competence, in relation to the view of reading maturity and higher-level reading development guiding this investigation.

Benjamin: "What can I write about that would be smart?" Benjamin was at the younger end of the age distribution, at 25, and had a moderate amount of experience at graduate school study, with 2.5 years. However, his area of study was English Literature, which was thought possibly to position him strongly to have

experience with author-oriented text analysis, and thus to support his likelihood of being a more mature reader.

Benjamin's memories of early reading were strongly positive; he reported enjoyment and ease with learning to read, "It came pretty quickly, I would always, I would always just dive in...good memories, it was never, you know, a scary thing, for sure." He remembered enjoying his father's regular reading aloud, that he was pretty young when he started reading, that he made an attempt to read a difficult book (*The Hobbit*) in first grade, and he was competitive, wanting to read because his cousin could.

In elementary school, he remembered learning phonics rules and reading timed passages, with respect to which he again reported being competitive and trying to be the fastest. He participated in Accelerated Reader in fifth and sixth grades, a program in which points are awarded (and rewards often given) for personal reading based on the length and difficulty of the text and success on a computerized comprehension assessment. He said, "I do like to win, at games, and so I got a lot of points." He mentioned particular prolific authors such as Gordon Korman and Beverly Cleary, and described his reading of their books as, "I mowed those down." After middle school, he still liked to read, but not as much, "I was a fanatic in middle school...it definitely tapered off as I developed other interests." Benjamin majored in English Literature in college, and commented that, "I've always felt at home with the books." He mentioned again that he did not read much for pleasure now because of the extensive reading he does for school, but that he enjoys what he reads for school,

which includes novels and philosophy, "reading for pleasure is rarer for me now, but, you know, I'm always reading and I do enjoy it."

Benjamin felt that he had changed as a reader, in the sense that he had developed a different lens or perspective on reading as a result of his study of literature in graduate school as well as in college, framing this change negatively for the effect that it had on his ability to read with immediacy and immersive enjoyment of the story, "When you study literature, it's harder to enjoy it in the same way because everything becomes so self-conscious, you're seeing, you're beneath the surface, and you can't just get into the flow of the emotion as much, maybe because you're, you're thinking too much." In this sense, his experience of learning to do text analysis was perceived as having had a somewhat negative effect on his capacity for unreflective enjoyment of reading.

With regard to his current reading, Benjamin reported reading every day for school, with his reading consisting of philosophy, literature, literary criticism, and poetry. He described his focused attention when doing this reading, "since I'm reading for school, I get into like this, this zone of focus, so, you know, I'll forget that the laundry finishes or that I haven't eaten lunch or something, so it's kind of like an integrated attention." For his own purposes, Benjamin reported primarily reading online, social media and blog postings; otherwise he did very little personal reading. When Benjamin described his interests as a reader, in response to a later question, he mentioned his academic interests; that is, literature, philosophy, and scholarly stuff. He also identified a particular type of coming-of-age story that he enjoys, "I love those novels where the, the bildungsroman, where the protagonist learns something

about himself, I love the growth in the character, and the, um, seeing different lifestyles come into sharp relief, and learning how to understand and value people in their differences. A good, liberal, wishy-washy goodness."

Benjamin said that he was probably a lot interested in reading, but this is because it is necessary for the career that he has chosen, "I like to talk impressively about ideas, and write impressively about ideas." The way he felt now about reading was different from "the pure joy of reading in, you know, seventh grade, where it was just like, you just wanted to get lost in that world, and that was it." These days, Benjamin said, pleasure reading usually feels like a waste of time, and that "I enjoy movies now or TV shows for fun, more than books." He then mentioned a fantasy series that he was working through slowly and irregularly when he has time, and how good he thought it was. But he said that this type of reading was a very small part of his reading now, and that he would rank reading lower than writing in importance for him, "getting the ideas out, sending papers to get published or whatever, making a great presentation." He saw reading as a stage in the process of having something to write, a means to an end.

When Benjamin described what happens for him during reading, he turned immediately to his reading for school, which he characterized as a process involving convergent attention and tuning out of everything else, in which he was exploring the turning of the logic and getting the philosophical import of the novels he read, "if I'm reading a novel, you know, I'm not just reading it to see if, they finally get past their prejudice and get together, there's also layers of, you know, what did this mean for the nineteenth century philosophical critique of religion, or the freedom of

consciousness...all those sort of literature-y questions." He brought to the reading his own analytical framework, "and what my pet interests are, what I can write about that would be, that would be smart." For him, this type of school-related reading was relatively effortless, "when I'm in the zone, it's not work, it's, you're just flowing." He also felt that it had become difficult for him not to read this way in other situations, "it's hard not to do that, it's hard to separate."

When asked what he knows about reading, nothing came to mind for him, and Benjamin said he has thought more about what he knows about writing, because he has to think about that as a teaching assistant helping undergraduates with their writing. He described good reading as needing, "to see what the text itself is doing, you don't want to bring your own prejudices to it." This brought to mind for him two specific anecdotes related to literary criticism about not reading into the text what you want to see or responding to it emotionally or judgmentally. The approach that Benjamin saw as critical for good reading was, "what's the purpose, what's the mood, what's the kind of feeling and the kind of values that are at stake in it itself, can you separate out your own strong emotional responses and then be a charitable reader," and this requires suspending your own wish to judge and your own emotional response.

In describing himself as a reader, Benjamin began by identifying positive attributes of his reading, "I try to understand and get the point, get the feeling, and try to be sympathetic." For him, what came to mind immediately was that he is focused and attentive to the text, "Focused, I'm good at focusing when I read, and attentive. That comes to mind right away." He identified his weakness as being his own

propensity to judge and to impose his own values, "I have strong, I think the thing I was talking about before with not bringing your own framework of value, I have pretty strong and pronounced, you know, values or opinions or something, and I could maybe be tempted to read stuff through the lens of, you know, the philosophical framework that I care about the most at the time," and said that this was an area where his reading could improve, "so getting more absorbed in that world, I think there's always room for improvement there, for me, with my strong opinions." His general reading approach was oriented toward learning and growth, which he described as his default mode. His aim when reading was similar, "the learning, the growth thing," but he recalled here also his "middle school glory days" when reading was just to "get away, to get involved, and just for the pure joy of it."

The four passages Benjamin read were on Anabaptists (LK-HI), Silk (LK-LI), Algebra (HK-LI), and Mythology (HK-HI). His prior knowledge scores were lower for his low knowledge passages (1 for Anabaptists, 0 for Silk), and higher for his high knowledge passages (3 for Algebra, a very detailed response scored 5 for Mythology).

In his think-alouds, his engagement was consistently high, but was very much higher for the last (HK-HI) passage on Mythology. His patterns of think-alouds behavior differed somewhat across the four passages. For the first (LK-HI) passage on Anabaptists, his thoughts and behaviors mostly related to derivation of meaning, with a lot of restatement of text. With the second (LK-LI) passage on Silk, he attended more to affect and motivation than to message or text, commenting regularly on his own negative perception of interest. For the third (HK-LI) passage on Algebra,

his attention to the message increased, and he connected to context and evaluated with regard to multiple aspects. For the final (HK-HI) passage on Mythology, his attention to message was very high; in particular, he was arguing with the text and considering author intent. He became very engaged in figuring out how the author was using this entry as a way to forward his own critical views of Catholicism under the guise of talking about ancient mythology. He developed an initial hypothesis that the author had some kind of religious bias, and pursued the building up of an analysis confirming that hypothesis as he read on in the passage, accompanied with expressions of positive interest and amusement.

With regard to performance on the outcome tasks, Benjamin's responses similarly differed across the passages. For the first (LK-HI) passage on Anabaptists, he gave a long summary about what was in the text, while for the second (LK-LI) passage on Silk, he simply listed several isolated facts from the text. For the (HK-LI) passage on Algebra, he reported learning a new idea from the text, "It has become apparent that a standardized system of symbols for basic mathematical operations didn't just always exist but had to be invented (something I had not thought of before). I knew everything else." For the (HK-HI) Mythology passage, though, what he learned was exclusively related to learning about the biases of the author, which he described in an extended response, "I learned little about mythology....The author uses his discussion of paganism (defined crudely by a propensity for hero worship) to critique the contemporary canonization of saints."

In evaluating the reliability of the material presented in the passages, for the passage on Anabaptists, Benjamin mentioned argument, bias, and specificity; for silk,

he mentioned argument and specificity, for algebra only specificity, and for mythology only bias: "In general, the author failed to present ancient religion in an unbiased and charitable way." His responses here were much longer for the two passages for which he had high interest, Anabaptists and Mythology.

In the follow-up interview, Benjamin described his reading experience as having been a demonstration of, "one of my styles of reading, which I think, I think does parallel how I read, the intense form of reading that I do for stuff I'm gonna be writing about." He felt that he did not learn very much, but that he enjoyed this encounter with texts from the past, stating that, "it was cool to see how these authors, the views that they had and kind of get a sense of what the ethos was like, and how different it is from today." He reported that he "wasn't a huge fan of the algebra and the silkworm article, but the other two were, were more interesting, you know." He felt that he read differently if he thought he detected an underlying agenda or polemic. For the algebra and silkworm article, he did not feel it as necessary to fully understand every nuance, because "there was nothing very compelling at stake." He identified his goal as being to generally understand the passages, in the sense of having a pretty clear understanding of the basic concepts at stake. He described digging more into the text when he thought it important to expose, "the author's own polemical views" or to unpack "the prejudices or the mistakes," as in the silkworm article. When I asked him about his attention to the rhetorical structure of the text when reading, he responded that, "it's not like I find structure interesting in itself, you know, like I don't love to just dissect the structure, but it's part, I think, an essential process for understanding the ideas, just for comprehension, you know, so it's not, it's

not like I find form particularly interesting," and went on to make clear that he does have academic colleagues for whom form and rhetorical structure are a particular interest. Throughout the follow-up interview, Benjamin repeatedly talked about something being "at stake" in the process of reading. In the final question where he was invited to bring up anything that had come to mind, Benjamin mentioned that it would be interesting to do a similar exercise with participants reading fiction, noting particularly that in this reading situation with encyclopedia entries "the stakes were geared toward comprehension" whereas with fiction it would be "like a different thing than trying to grasp the logic, but would be more related to like, character, other things."

The portrait of Benjamin derived from these data is one of a reader who is oriented toward the development of a way of reading that will further his pursuit of his academic interests. He is strongly analytical, and enjoys exercising these analytical powers, even experiencing effortless immersion when reading for school. He enjoys the reading he does for school, and has a history of enjoying reading strongly, but now values reading more for how it contributes to his successful performance in academics. The lens he has developed from his graduate studies of Literature does position him to immediately consider the author when reading, but, as he notes, this is not particularly beneficial for good, open reading if the analytical framework he is interested in or his own evaluative reaction or even his own desire to have something clever to say or to write dominate what he then does in reading.

It appears in his case that having a critical perspective without also having a corresponding openness may prevent the ability to engage with the text in a genuinely

communicative and collaborative fashion, which is an area for improvement he identifies in his own reading. Although Benjamin approaches reading with the intent to learn, he may not be able to be receptive to what the text does have to offer, and also may not hold himself responsible for deep understanding in cases where he does not see the text as connected to his own interests. The importance of his own interest for him was also evident in the differences in how Benjamin approached and interacted with these four passages, depending on how interested he was in their topic. An approach to reading that focuses primarily or exclusively on what is at stake and less on what is being offered can be a powerful analytic approach, and can certainly get the job done if the job is critical interpretation. In this sense Benjamin is heading along the path toward expert reading in the domain of Literature from the standpoint of critical analysis; however, this path has in some sense diverged from that of reading maturity and of reading to learn and for self-directed growth, insofar as it privileges the generation of a critique over the encounter with the author and what he or she has to say, and insofar as it narrows the scope of what type of learning is pursued and valued.

Describing the Phenomenon

In the description of reading maturity by Gray and Rogers (1956), which they derived from bringing together their hypothesized characteristics and evaluative scoring categories and the set of selected cases of mature reading that they observed by collecting interview and performance data and applying these scoring categories, six distinguishing characteristics of the mature reader were identified. These included: having reading as "an inseparable part of daily living" (p. 224); spending an

appropriate amount of time on reading as suits their needs and circumstances; reading deeply about one particular interest area, although not necessarily with great breadth across multiple interests; reading for self-development, and showing "full recognition of the value of reading as a tool for individual growth" (p. 224); choosing reading material that varied in its level of challenge and learning affordances, although with much of it being at a high level; and showing very high levels of reading competence in grasping meaning, as well as in interpretation and evaluation.

Gray and Rogers were particularly interested in whether maturity in reading would tend to involve having great breadth of interests or reading intensively about one particular area of interest; whether it required reading only materials that were highly challenging; and whether it required devoting considerable time every day to reading. They found that only having a particular interest area for which one was engaged in in-depth learning seemed to be associated with what they identified as mature reading in their cases.

Gray and Rogers developed this description from looking at cases of mature reading in a set of middle-aged and older adults chosen as having been identified as likely candidates, and including readers from a variety of backgrounds and experiences, including, for example, university professors, social workers, researchers, pastors, retired executives, and news analysts. In this study, the set of cases is taken from graduate students in pursuit of higher-level academic learning; they all, therefore, by definition were engaged in on-going in-depth learning about a particular subject area and reading intensively about that subject. By narrowing the set of cases in this way, a closer look could be taken at the intersection of this type of

dedicated and intensive reading in an academic context with the other attributes of reading maturity. Here the particular tension to be resolved related not to breadth and depth or to time spent on reading, but to what emerged as a significant tangle seen from the standpoint of this perspective on reading in the overview of theories of reading development and discussion of empirical research on high-level reading development: whether and how these participants participated in and viewed reading as for self-development, in this situation in which they were also reading for academic development. This bears directly on the issue of what is taken as the endpoint of reading development and how educational, academic, and out-of-school experiences may represent convergent or divergent pathways toward that endpoint.

Along with narrowing of the set of cases, the types of evidence collected were expanded to include direct questioning regarding readers' understandings of reading and perceptions of themselves as readers, and observations of reading behaviors and readers' performance under conditions of varying levels of topic knowledge and topic interest. Gray and Rogers (1956) inferred understandings and perceptions from their participants' responses to questions about what they read and why, did not observe behaviors during reading, and had their selected mature participants read only one passage, which was of different familiarity and interest to different participants. The following descriptions of reading maturity and reading competence therefore focus on what this investigation has brought to light about reading maturity and reading competence by looking at these specific participants, by seeking to understand this particular tension, and by using these particular forms of evidence.

Reading maturity. The phenomenon of reading maturity as seen across these participants confirmed the presence and role of Gray and Rogers's (1956) six distinguishing characteristics, although these characteristics had different emphasis in these data because of the nature of the observations and participants selected. Here again it was seen to be important for reading maturity:

- to regard reading as essential and part of one's daily life
- to read in ways that supported one's needs and circumstances (which here typically meant a lot of school reading and also regular personal reading to broaden one's vistas)
- to see reading as important in supporting one's individual growth (beyond simply one's growth in the sense of accomplishing academic purposes or accumulating knowledge)
- to read a wide range of self-chosen types of materials (with the understanding that all participants were also regularly reading highly challenging material for their academic pursuits)
- and to demonstrate high competence in being able to read texts presenting a variety of challenges with regard to content, context, and interest level with engagement and for comprehension, interpretation, and evaluation.

Beyond this already quite interesting confirmation of what was seen in Gray and Rogers's (1956) study, in the more specifically focused story of reading maturity seen here, the phenomenon of mature reading has most essentially the character of critical openness, with its other attributes and qualities flowing from that essential

core. The grammatical structure of that phrase, with openness as the noun and critical as adjective, is intended to suggest that openness is the underlying state that is enhanced by the emergence within it of a critical stance.

Being critical and being open seem oppositional in nature, and the successful fusion of the two of them requires a genuine commitment to both as essential to reading and learning. It involves informed risk-taking and intrinsic motivation to learn, most specifically to learn through interaction with the ideas of others as communicated in text. Mature readers are open in their willingness to approach another person through text, but they are critical in approaching the other as having a communicative purpose or message. They are open in their willingness to be transformed, in their awareness that learning may involve such transformation, and in their acceptance of this both as a responsibility and as one of the best things that one can do. They must at the same time be critical in having respect for both themselves and the authors and texts they read, in their acknowledgement that the transformations that such learning involves are real and matter and therefore have a lot at stake, and in their sensitivity to the importance of perspective and intentionality. It is, in a sense, a paradox of approach and distance—the mature reader must be open in approaching the author, but must also maintain enough distance to evaluate.

In considering the specific situation of the readers participating in this study, it appears that the type of training in intensive reading undertaken for graduate study is successful for the most part in inculcating a critical attitude and a skill-set related to critical appraisal (if not already present), although the extent to which readers are comfortable in extending these beyond the specific situation from which and for

which they have been learned may differ. This falls short, however, of reading maturity unless the necessary openness is present. Criticism for its own sake, as a default mode of engaging with text because that is how it is done at a certain level, may prevent or occupy attention that could otherwise be directed toward considering what the text does have to offer and listening to the author's voice. Studying a single subject area intensively does not in itself foster that type of openness, and would seem rather more likely to take it out of the picture altogether (e.g., Scardamalia & Bereiter, 1991). The openness to learning that leads a reader toward pursuit of further knowledge can take the form of openness to that specific subject matter as the object of knowledge, rather than genuine openness to learning itself or to reading as a way to pursue learning and self-development (Alexander et al., 2011), and this, too, would fall short of reading maturity as characterized here.

It is also the case that just openness is not enough for mature reading; several participants expressed views of reading and of their own approach to reading that suggested openness to learning, readiness to approach, and high valuing and importance of reading, but without the corresponding intention to discriminate and evaluate what was read, or without the necessary underpinning of knowledge and skill to do this across reading situations. As Chall (1983) put it (when discussing her highest stage of reading development), "a great deal of knowledge is needed, as well as confidence and humility." The mature reader must be a generalist, not limited to specific situations, specific types of reading, or specific topics about which to read; only by being such a generalist are the fullest opportunities of learning and self-development through reading afforded. By the same token, and in a sense echoing

the paradox of critical openness, the mature reader must also be sensitive to the particulars of the situation, and attentive to the author's voice and intention.

Pegging reading maturity (as distinct from reading competence) at the level of openness and critical response means that for the mature reader, comprehension is simply not the predominant issue—even with unfamiliar or uninteresting texts such as those read here. This reader is already oriented toward and focused on getting to interpretive, evaluative, conversational interaction with the text, because that is how the type of learning sought will be achieved. However, this is not accomplished by skipping over the need for thorough and principled understanding of the text; it is accomplished by being so practiced and skilled at arriving at such understanding that it no longer requires continuous dedicated attention. The evidence regarding readers' behaviors during reading provided by the think-aloud data collected here for reading across the four encyclopedia passages used strongly supports this characterization of mature reading, as does the evidence regarding readers' performance in reporting what they considered themselves to have learned and their evaluations of reliability, along with readers' own understandings of reading, descriptions of the nature of good reading, and descriptions of themselves as readers. The case study of Frances illustrated how these data highlighted the presence of the phenomenon of mature reading. However, no one participant perfectly displayed pure and exclusive maturity of reading, just as was seen by Gray and Rogers (1956); the portrait of the phenomenon that emerges is taken from the collective views of reading and readers provided by these cases.

A corollary issue in this description of mature reading is the degree to which the reader considers learning to be situated exclusively in school or as belonging to all types of activities, which was strongly illustrated across these cases, and did not feature at all in Gray and Rogers's work with older adults (1956). Reading for many participants here was more or less strongly separated into two types of reading that were strongly distinct as behaviors. One was reading simply for escape or enjoyment, which was engaged in outside of school, was self-chosen and independent, was experienced as immediate or uncritical, was often connected with a period of intense and deeply relished reading during elementary and middle school, was seen as involving little effort and generally passive, and was typically associated with the reading of fiction.

The other was reading in order to learn—either to learn what the text said directly or to garner something from the text to use, which was engaged in during school or in relation to school, was typically other-chosen and directed toward goals set by others (although not as much for readers further along in their studies and developing their own research interests), was experienced as mediated and critical (for the type of reading engaged in during graduate school), was often connected with reading tasks and activities introduced in later years of schooling, particularly in high school and college, which marked the end of the "glory days" of reading, was seen as requiring active, motivated (and strategic, for the graduate students studying reading) effort, and was typically associated with the reading of nonfiction. The first type of reading has many parallels with the aesthetic reading stance identified by Rosenblatt (2004), and the second is similarly parallel to her efferent reading.

Mature reading, on the other hand, does not divide reading into these two types of behaviors; it is one behavior that can meet all of these needs (or move beyond them) simply by being itself, and by pursuing its own unified goal of learning for enjoyment and self-development by way of critical openness. This view of reading as divided or as united was a strongly evident thread running through the responses of participants and emerging also in what they made of the reading and learning situation presented by the different encyclopedia entries.

An interesting taxonomy of ways of reading was developed by Berntsen and Larsen (1996), who used the dimensions of personal/nonpersonal and experiential/instrumental to distinguish four ways of reading, which are not mutually exclusive. In personal experiential reading, the reader has the sense of personally experiencing what happens, while in nonpersonal experiential reading, the reader observes or watches the experiences, obtaining excitement or relaxation from this kind of vicarious involvement. In personal instrumental reading, the reading has utility for the reader in ways that transfer to his or her own self-understanding or applicability to future experiences, while in nonpersonal instrumental reading, the reading has utility in ways that provide greater knowledge of reality outside the reader's own experiences, or for acquisition of information. The dichotomizing of reading described above is centered on the difference between nonpersonal experiential and nonpersonal instrumental reading, as described in Berntsen and Larsen's taxonomy, while the unity of reading from the standpoint of the mature reader resides in the personal nature of their instrumental reading and the instrumental nature of their personal reading. This suggests that the reader's personal identification

with learning as accommodative is the foundation of mature reading as oriented toward learning and self-development through reading.

With regard to the importance of formative reading experiences in or out of school, therefore, or of age or other possible attributes related to reading development, the characterization of mature reading as essentially distinguished by critical openness means that these formative reading experiences and other attributes would bear weight for the development of mature reading only insofar as they fostered the movement toward critical openness together with the underlying reading competences it requires. These experiences and attributes are further important, as seen particularly in the data about readers' views of reading and of themselves as readers both at the current time and in their reporting of their background as readers, insofar as they introduced or promoted the view that reading is one unified behavior across contexts, situations, and types of text. However, there is no particular pattern in the data suggesting that any particular configuration of the experiences and attributes investigated here is what would tend to bring forth a stance of critical openness or a unified view of reading. The very interesting question still remains of how learning and self-development come to be seen as inherently desirable, as accommodative, and as bound up with the type of interaction with others that reading provides.

Reading competence. In their investigation of reading maturity, Gray and Rogers (1956) identified reading competence as having three aspects: grasp of meaning, including literal meaning, inferential and interpretive meaning, connection to background knowledge and personal experience, and drawing of conclusions;

evaluative reaction, including evaluation of the importance, quality, and accuracy of the content and the suspension of judgment while reaching evaluative conclusions; and application, including recognition of personal and social value of the ideas gained from the text, and insightfulness in identifying such possible personal and social uses. In their framing, high reading competence is one aspect of reading maturity, together with reading habits and attitudes toward reading. In this study, reading competence is seen more narrowly; in particular, the third aspect regarding personal and social application is not inherently connected with reading competence. In the sense of successful comprehension, interpretation, and evaluation, high competence in reading is considered to be necessary for reading maturity, as described earlier, but it can also represent the endpoint of particular paths in reading development.

The phenomenon of reading competence, as seen across these cases and through the lens of the perspective on reading taken here, has essentially the character of being schooled reading. High competence is where you get if you go as far as you can with reading as it unfolds in school, where you are expected to be able to read materials from many different subject areas in order to assimilate their content. Competence is agenda-driven, serving the purpose of understanding, gathering useful information, and critiquing. It is the approach to reading as a task, a job that needs to be done, and it typically refers primarily to reading of informational text. From the standpoint of reading competence, reading fiction for enjoyment does not get any job done; in fact, the whole point of personal reading is that it not be directed toward any end other than escape or entertainment (which does mean, though, that being able to read fluently enough to enjoy a story would be important). Reading competence is

having the tools and being able to use them; and the competent reader sees having the tools as the point of reading development.

The reading competence that emerged in these data as having the character of being schooled can take two forms, each reflecting a different theoretical framing of the endpoint of reading development in relation to domain-specificity and domain-generalness. One is the generalized ability to read well (in the sense of reading actively, with engagement, grasping meaning, interpreting, and evaluating) across any reading situation, even with low-interest, low-familiarity texts (e.g., RRSB, 2002). In this type of competent reading, the reader views himself or herself as in control of what happens during reading, as capable of bringing to bear whatever effort may be necessary (although being typically so skillful that in many situations little directed effort toward meaning may be necessary), and also as enjoying the acquisition of knowledge that is seen as the outcome. This pattern of competent reading was evident in the data, and exemplified in the individual case study of Frederick. With regard to Berntsen and Larsen's (1996) taxonomy, therefore, for this type of competent reader, reading has a primarily impersonal nature. When it is for learning and task-accomplishment it is impersonal and instrumental, and when it is for its own sake it is primarily impersonal and experiential (although there was one participant who described having very vivid and immersive personal experience when reading the very specific type of fiction that she enjoyed).

The other type of competent reading is contingent upon the circumstances, in that what happens in the way of excellent reading is conditioned upon having strong subject-matter knowledge or interest (e.g., Alexander, 1997, 2003a, 2003b, 2006). In

this type of competent reading, the reader's ability to come to grips with the text depends on having some entry to the text by way of a foundation of subject-matter knowledge, and the reader's ability to bring forth the effort necessary for this type of engagement depends on having an attraction to the subject-matter being read about. This reader would appear differently competent, therefore, in different reading circumstances, and does not have the same type of perceived control of the reading situation as does the generally-competent reader. Such situationally-responsive competent reading in the form of both the knowledge-reliant and the interest-reliant reader (Alexander 2003b, 2006; Dinsmore et al., 2010; Fox et al., 2009), was also evident in these data, coming to light particularly in terms of variability in behaviors and performance across the four encyclopedia passages read, as, for example, in the case of Benjamin.

When carried to its endpoint, competent reading as bound up with subject-matter knowledge and interest is the specialized reading of the expert reading in his or her area of expertise (e.g., Alexander, 1997, 2003a, 2003b, 2006; Chall, 1983). In this situation, the reader achieves consistent excellence by narrowing his or her reading and learning exactly to the subject-matter for which there is high knowledge and interest. Although the type of reading material provided to readers in this study did not in general elicit such specialized reading, there was evidence provided in the case of Benjamin of the schooled competence of the expert and of its character as distinct from mature reading. With regard to Berntsen and Larsen's (1996) taxonomy, such competent reading has perhaps found a way to make impersonal and

instrumental reading personal, by identifying the reader's interests so strongly with a particular subject-matter that it comes to be in some sense personal to learn about it.

The characterization of competent reading as schooled is also intended to suggest that this view of reading development is predicated on the dichotomization of reading described in relation to reading maturity. Therefore, with regard to the importance of formative reading experiences in or out of school, or of age or other possible attributes related to reading development, the characterization of competent reading as essentially distinguished by being schooled means that these formative reading experiences and other attributes would bear weight for the development of competent (rather than mature) reading insofar as they fostered the view of in-school and out-of-school reading as essentially different reading behaviors. It would also be important to consider the degree to which they encouraged a view of learning as task-like and assimilative (e.g., Marton & Booth, 1997; Marton & Säljö, 1997; Säljö, 1997). In addition, they would be important insofar as they promoted success at the type of reading valued within school and interest in what can be achieved by becoming good at that type of reading, that is, competent rather than incompetent or less competent reading.

Once again, it is difficult to detect in these data any specific patterns or configurations that would suggest that particular attributes and experiences (among the set of those investigated) together point toward reading competence (rather than maturity); neither is it clear that there is any particular time-course or critical point at which this happens, bearing in mind that these are self-reported memories.

The achievement of reading competence is not a small thing, and it is not intended to be devalued by how it is described here; it is for many readers a very worthy goal and a valuable endpoint for their reading development. It does get many very important jobs done, and permits as well the genuine enjoyment and escape reading can offer. However, in light of the larger view of reading as a complex, communicative, contextually-anchored, purposeful, and transformative behavior, and in the projective effort to see what reading development on that view can lead to, this type of reading competence falls short of what reading can be, when it takes the form of critical openness and is coupled to the pursuit of the transformative self-development and learning that reading can bring.

CHAPTER VI

DISCUSSION

This chapter discusses what has been learned from this study. It begins by revisiting the rationale for the study, in order to provide the context within which to present the findings. After laying out the findings, possible limitations to their strength and scope are identified and considered. Finally, the practical and theoretical significance of the findings are discussed, and suggestions for future promising lines of research are forwarded.

Findings

This study investigated the nature of higher-level reading development in adults. Theories of reading development vary in what they identify as the desired endpoints of reading development, with one key difference being whether reading is fundamentally seen as instrumental for accomplishing tasks or as a mode of personal growth. Difficulties associated with understanding higher-level reading development from the point of view of reading as essentially instrumental include the conflict between understandings of higher-level reading development as increasingly specialized and understandings of higher-level reading development as involving consistency of reading performance, even in situations of low knowledge or interest.

Gray and Rogers (1956) conducted a study of maturity in reading in which they considered the full flowering of the potential of reading to be the engagement in reading as a form of self-development. Their study considered reading-related school and home experiences, reading interests, reading habits, and reading performance. They used a profile-building collective case study approach in which they developed

theoretically-grounded criteria by which to organize the data, but tuned these criteria to the specifics of the data collected. This study revisited Gray and Rogers's investigation and expanded upon it by including additional relevant aspects of reading maturity derived from consideration of other theories of reading development and the theoretical and empirical literature on higher-level reading development and by focusing on graduate students as competent and potentially mature readers. Additional types of data collected beyond those obtained by Gray and Rogers (1956) included think-aloud data enabling the observation of the reader's behaviors during reading. Reading performance was observed across reading situations varying in the reader's level of topic knowledge and topic interest, with passages matched to the reader. Additional interview data were collected related to readers' understandings of reading, their knowledge of reading, and their views of themselves as readers, which enabled the exploration of the importance of these factors, identified as important in more recent research related to reading competence and maturity.

A collective case study design was used, looking across the participants and their various forms of data to identify patterns and themes revelatory regarding the phenomenon of reading maturity as it appeared here. Reader profiles were created, highlighting possible aspects of reading maturity with regard to reader characteristics, experiences with reading in and out of school, understandings of reading, self-perception as a reader, behaviors during reading, and demonstration of what was taken away from the reading experience as outcomes. Exemplary individual case studies were presented, giving a more embodied form to the meanings of the codings used in creating the profiles and illustrating how they distinguished the presence of

attributes and aspects comports with likely reading maturity from those distinct from it. Finally, the research questions regarding how the phenomenon of reading maturity (and of reading competence) observable across these cases and expanding upon what was seen by Gray and Rogers (1956) was characterized were addressed.

Three aspects of the findings from this study will be considered here. The first is the degree to which the additional forms of data collected beyond those used by Gray and Rogers (1956) were of value in highlighting reading maturity and in discriminating it from reading competence. The second is whether the selection of a narrower group of participants was additionally informative regarding reading maturity, beyond the grouping of select cases used by Gray and Rogers. The third is, given the closer look at higher reading development provided by having these data for these participants, what do the descriptions of the phenomena of reading maturity and competence that were developed offer that goes beyond the findings of Gray and Rogers?

Data types. With regard to the use of the data in the profiles and the value of collecting these types of data, it appeared that knowing about participants' level and type of graduate school experience was more important for characterizing the nature and level of their reading competence, rather than maturity. Asking about participants' background experiences with reading as framed by questions positioning it as in-school and out-of-school was highly relevant for the emergence of reading maturity or reading competence, most particularly with regard to the presence of a distinction between two types of reading or their merging. Learning to read, however, had been a relatively uniformly positive experience for these participants,

and although knowing about whether they remembered out-of-school experiences connected with learning to read was suggestive, it did not seem directly associated with any differences in participants with regard to other aspects of their reading. Asking readers about their perception of whether they had changed or not as a reader was interesting primarily for understanding their status with regard to certain aspects of reading competence, and a number of readers did here identify academics or graduate study as having changed them as readers. It was not illuminating for understanding reading maturity across cases, however.

Directly asking participants about their understandings of reading and their perceptions of themselves as readers produced important information relevant for understanding reading maturity, in particular about the absence of boundaries between two types of reading, about the attributes they associated with good reading and what type of aim for reading that implied, about their general approach to reading, and the types of goals at which they themselves aimed. Knowing about current reading habits and value and importance placed on reading provided an additional opportunity for corroboration of participants' view of the place of reading in their life, as was important also for Gray and Rogers (1956). As was found by Gray and Rogers, it seemed that regularity and some breadth of reading were important rather than high amount and wide variety, particularly in this situation when participants were also generally doing regular, intensive, and challenging reading associated with their academic pursuits. However, asking about participants' knowledge of reading and about their interests in reading did not produce additional useful information under these circumstances.

Finally, observing how participants interacted with four different passages expected to present different challenges in the way of familiarity and interest, and considering what they felt they had taken away from the text in the form of learning and their ability to articulate an evaluation of its reliability did materially assist in identifying and distinguishing reading maturity and reading competence in this situation. Particularly informative were participants' consistency and engagement in attending to message, author, and text across these readings, the type of learning they saw as appropriate under these circumstances and for these texts, and their adaptive use of appropriate criteria for reliability for these texts. However, these data on reading behaviors and outcomes still have a lot to offer, and these analyses have highlighted only one way in which they can be informative.

Participants. With regard to the narrowing of the pool of participants, the selection of graduate students created relative uniformity across the collected cases in terms of positive early experiences with learning to read, types of current academic reading, and views of the goals of academic reading. They were relatively young, and had all chosen to dedicate themselves to higher-level academic studies in order to achieve a high level of mastery of a particular subject matter. The presence of that focus for their school reading and learning and their uniform participation in training to read as appropriate for their academic pursuits were critical for being able to distinguish participants with an impersonal and instrumental approach to school reading and those whose approach was personal and instrumental, both in and out of school. That none of them were yet experts in their fields meant that they had not yet reached the point of complete personal identification with their subject matter, so that

the distinct paths of personal growth and assimilative learning could be identified. In addition, that these participants, as graduate students, were all in a position of having regular academic reading demands made those who still chose to regularly engage in personal reading stand out even more clearly.

Their presumed functionality in terms of being able to read the challenging passages they were given here, and to respond to the somewhat unusual reading situation with willingness and composure were indeed evident. However, beyond that, there was considerable variability in how well participants read across passages, in their levels of engagement, in their types of engagement, and in what they brought away from the reading. Some of the participants struggled mightily with the less familiar or less interesting passages, which is apparent in their profile, in that they had little attention left over for consideration of message or text. In this sense, therefore, this selection of participants served well to illustrate the different types of reading competence, along with also signaling the presence and shape of the phenomenon of reading maturity as distinct from these.

Describing higher-level reading development. From the closer look at higher-level reading development afforded by the data collected from these participants, the description of reading maturity arrived at characterized maturity in reading as essentially critical openness. It further linked this to an essentially unified view of reading as a single type of behavior, which was aligned with a way of reading identified by Berntsen and Larsen (1996) as personal and instrumental. It was seen as supported by general high competence in reading, and to be general in character, although also responsive to the particulars of the voice and intentions of a given

author in a given situation. This goes beyond Gray and Rogers (1956) in bringing together the essence of mature reading as a phenomenon. They had many descriptors that tracked together, but did not see them all emanating from any central meaning of mature reading, other than that of developmental maturity itself and the desire for personal growth and further self-development. In addition, because Gray and Rogers looked for their participants to those they considered already fully mature, they did not encounter in their data the tension of in-school and out-of-school reading that proved to be so valuable here in determining what was different about readers' approaches to reading.

Gray and Rogers (1956) only described reading competence with regard to its role as a component of reading maturity, and identified three different categories contributing to reading competence: grasp of meaning, evaluative response, and application, which were all equally important. In this study, reading competence was similarly viewed as important in supporting reading maturity, but with the idea that competence with regard to grasp of meaning and with regard to evaluative response were separable from application with regard to personal and social uses, which belonged only to maturity. That view of competence as grasp of meaning and evaluative responses was associated with the characterization of competence as essentially schooled, and as linked to an essentially dichotomized view of reading as a behavior, with learning and effort separated from escape or entertainment and enjoyment. Competence was described as implying an approach to reading development as essentially impersonal and typically instrumental, that is, a task-like view of schooled reading. Two possible endpoints in development of this

competence were distinguished as both evident in these data. The one aims at a general cross-situational capability in which the reader is in control of the reading situation, and reads to accumulate information. The other is more situationally dependent, conditioned particularly on the reader's knowledge and interest in relation to the subject-matter, and producing as its endpoint the specialized excellence of the expert reader, reading expertly in his or her area of expertise.

Limitations

In the description of the design of the study, a number of issues associated with collective case study research were identified. These issues are relevant with regard to possible limitations on the strength and scope of the findings and the conclusions drawn in this study. In particular, it is important to consider the following:

- the degree to which this investigation explicitly confronted and respected the boundedness of the phenomenon under investigation, with regard to selection of cases and type of data collected;
- the sacrifice of the richness of particularity afforded by the variety and uniqueness of individual cases to the desired generality afforded by cross-case comparisons;
- the restriction of conclusions drawn with regard to generalizability and causal claims;
- the degree to which this investigation and the presented data analytic procedure and results satisfied requirements for exhaustiveness, completeness, reliability, and validity.

Boundedness. In order to study the phenomenon of higher-level reading development, the selection of cases for this collective case study was restricted to graduate students. Because the phenomenon of higher-level reading development as studied here involves a potential developmental progression from competent to mature reading, with competent reading taken as a precursor or prerequisite for mature reading, it was appropriate and necessary to select participants who were expected to be securely competent readers. The role of reading across a sample of adults who did and did not continue into academic life had already been investigated by Gray and Rogers (1956), and the limitation here to graduate students was intended to produce a finer grain of discrimination of reading maturity and reading competence, which it did appear to afford. However, this limitation does mean that the focus is on only a very particular portion of the trajectory of higher-level reading development; in Gray's theory (1949, 1951, 1954), higher-level reading development encompasses the span from the end of sixth grade on into adulthood. Clearly there is much territory left to cover in articulating what such development will look like; this study represents an attempt to begin such an articulation, by building upon Gray and Rogers's work (1956) at the higher end with mature adults. Any conclusions regarding the connection from early reading to these higher levels must remain speculative and projective, however, at this point.

A possible limitation with regard to participants is the small representation of participants studying the humanities; the case of Benjamin was discussed in detail, but the other participant studying the humanities, Gloria, provided a strong example of reading oriented toward critical openness, although she did not have high

confidence in her competence as a reader. The presence of additional participants perhaps coming in with this lens might have been helpful in fleshing out even more the phenomenon of mature reading and its possible relation to academic training. The lack of any participants studying mathematics could also represent a limitation, in that the type of critical reading they need to do could very well be different in kind from that done by students in the sciences. Therefore, although the selected cases certainly fell within the bounds of the phenomenon being investigated, they may not have fully inhabited those bounds; to the degree that they did not, there are possible limitations in the resulting descriptions of higher-level reading development.

Another central question related to the boundedness of the phenomenon regards the types of data collected, and whether they fulfilled the requirement of investigating the phenomenon as bounded in its real-life context (Barone, 2004). The interview data clearly targeted the real-life context of higher-level reading development and real-life aspects expected to inform its description. However, the performance data might appear to be somewhat distant from this. Why were participants not asked to read something they would choose to read as part of their own leisure or academic reading pursuits? As graduate students, participants did in fact regularly read challenging informational texts in order to learn from them, and did assess the reliability of such texts. For students, the experience of reading relatively unfamiliar and possibly uninteresting texts that are chosen by others is a real-life reading situation, and the responses of readers in such situations are highly germane to their higher-level reading development (e.g., Säljö, 1997). Given that cross-situational consistency related to topic knowledge and topic interest was an

important aspect of higher-level reading development in the theoretical framework being used here, the only practical way to get data on such consistency was to manipulate the reading situation; waiting for participants to happen to encounter such a reading situation was not a feasible option, and cross-case comparisons would have been even more problematic.

In deciding what it meant for reading competence for participants to read in a particular way across passages, the assumption was made that the nature of the individual passages did not matter quite so much as the attempted manipulation of level of topic knowledge and topic interest. In this way the identification of patterns of being knowledge-reliant or interest-reliant was made. However, it was evident that there were other types of differences between the passages that participants were also registering and to which they responded. Therefore, what was taken as most salient for reading maturity was the average of behaviors and outcomes across all four passages as an indication of consistency, rather than looking to the individual character of each reading of each passage. This would be a good place to do further analyses, and to look specifically at whether analyses by passage revealed any consistent patterns for different types of passages (e.g., procedural, descriptive, or philosophical in tone), although that there were not consistent numbers of participants reading each passage would need to be dealt with.

Generality vs. particularity. As with any collective or multiple case study, the data analysis and reporting of results for this study required to some degree a sacrifice of the richness of particularity afforded by the variety and uniqueness of individual cases to the desired generality afforded by cross-case comparisons (Stake,

2006). The reduction of the complexity of the individual cases to the very compressed snapshots afforded by the profiles was necessary in order to be able to see patterns that emerged across the cases. This is not a small sacrifice, but the complexity of the phenomenon and the variety and depth of the data could not have been grappled with otherwise. However, some measure of appeal to particularity in support of the generality being described still remains: in the three individual case study portraits; in the unique configuration of the profile created by each participant's own set of memories, experiences, understandings, perceptions, and behaviors; and in the detailed coding schemes provided in the appendixes, with examples of coded material that express the voices of individual participants across all of the cases, and link the individual character of each response with its general function as part of the larger coding scheme (Stake, 2006).

Generalizability and causal claims. This type of qualitative study cannot support causal claims and its conclusions do not generalize to a particular population (Yin, 2009), which means that the description of the developmental phenomena under investigation here cannot go the additional step of discussing what might cause a particular individual or a particular type of individual to follow one or another of the possible developmental trajectories identified. This restriction on the scope of the conclusions that can be drawn is clearly a limitation of this type of research design; however, this limitation is to some degree offset by the ability to take into account the complexity of the phenomenon, to use theory to guide the exploratory investigation, and to arrive at conclusions that extend and enhance that theory (Yin, 2009).

Exhaustiveness, completeness, reliability, and validity. No study can be perfectly exhaustive, complete, reliable, or valid (Yin, 2009). It is rather a matter of minimizing the degree to which the study falls short of these aspirational goals. The particular challenges of multiple case study research include the considerable amount of time and effort that must be spent on data collection, data analysis, and cross-checking or corroboration of the reliability of the many coding schemes and arrangements of categories involved (Stake, 2006; Yin, 2009). One of the consequences of doing a collective case study for my dissertation (and therefore as a sole researcher) is that there were unavoidable limitations on the extent of the data that I could collect, the depth of the data analyses that I could conduct, and the univocal nature of the decision-making process guiding those analyses.

With regard to the extent of the data collected, limitations noted above include the range of types of participants included as cases, and the inability to observe cross-situational reading performance in participants' own reading activities. Another possible limitation of these findings is the restriction of analysis of outcomes to the presence of certain types of responses, rather than also evaluating their quality. More could certainly be said about what these outcomes revealed about how well these participants read in this situation; again, this would be a matter for further analyses, and would involve figuring out how to get over the hurdle of developing a reliable scoring scheme when so many different passages were read.

A final possible limitation is the personal nature of the analysis, and that it was done with a very particular perspective on reading guiding the identification of themes and the interpretation of what they meant. This I attempted to meet by being

as transparent as possible about the origin of the perspective, about its role in the identification of the questions that were to be investigated, and about how it guided decisions that were made regarding data collection, analysis, and interpretation. I also attempted to be as explicit as possible about the steps involved in the entire process of data collection and analysis, in order to bolster the possible reproducibility of my findings were another researcher to re-do this same study (Yin, 2009). It is certainly entirely possible that from another perspective another interpretation could be made, or a different analysis of these data undertaken; however, that does not undercut the validity or reliability of this story, if the validity of the initial perspective is acknowledged and if it was indeed consistently and rigorously applied.

Significance

Although learning to read is a key goal of education and learning from reading is essential for participation in literate societies, an understanding of reading development beyond its early stages remains largely unarticulated (Fox & Alexander, 2011). Further, little is known about how adults' beliefs about reading, understandings of reading, and self-perceptions as a reader, as built upon their experiences with reading in and out of school, may support competent adult reading behaviors and foster on-going reading development, although the potential of such epistemic beliefs and understandings to impinge upon development has long been recognized (Chall, 1983; Perry, 1959, 1970). Competent adult readers are rarely asked explicitly about their own understandings of reading, reading backgrounds, or self-perceptions as a reader, while much of what is known about what adults can do in

the way of competent reading draws upon rather narrow investigations of professional reading by content-area experts (e.g., Pressley & Afflerbach, 1995).

Particularly unclear is the appropriate positioning of reading as cultural engagement and for personal growth (e.g., National Endowment for the Arts, 2007) and reading as important for accomplishing valued academic and professional tasks (e.g., Snow, Burns, & Griffin, 1998). Both of these roles of reading are implicated in the vision of literacy addressed in the Common Core State Standards (2010); however, it is not entirely clear how both involve the same understanding of what reading is, nor how both would be arrived at via the same developmental path. The purpose of this exploratory, descriptive study was to open an avenue for investigating these and other issues regarding adult reading development by inquiring about competent adult readers' understandings of reading, views of their own reading background and experiences, perception of themselves as readers, and reading behaviors in a challenging and unfamiliar reading situation involving various levels of anticipated knowledge and interest. Given this broader framing of the purpose of the study, what have we learned and where are we now?

Practical implications. The argument that this study would be of practical value was based on the premise that although the understanding of higher-level reading development is not currently seen as an important issue, knowing more about the endpoints of development seems necessary in order to guide the decisions made about the path that development should take early on. Given that the central findings of this study are that mature reading is an approach to reading characterized by critical openness and a unified view of reading, and that competent reading is

schooled reading and views reading as dichotomized, there seem to be a number of possible extensions of these findings to education.

First of all, at the broadest level, it does matter which of these forms of higher-level reading development is taken to be what reading development should be aiming at. Aiming for competence means letting go of the goal of reading for personal growth and the view of reading as a behavior that crosses over in-school and out-of-school contexts, while aiming for maturity can include and indeed requires the fostering of competence. The most recent articulation of aims of reading development in the Common Core State Standards (CCSS, 2010), although using language suggestive of the encouragement of independent, reflective reading, nonetheless targets a level of reading, career and college readiness, that is centered on being able to complete other-directed tasks. The CCSS also fall short of aiming at maturity in their overlooking of the critical presence of the author in the communicative interaction that is reading (Alexander & the DRLRL, 2012). The CCSS represent a step forward in moving beyond an exclusive focus on early reading, but they are still situated within a view of reading development that sees the aim of schooling as to produce schooled readers. However, the findings of this study suggest that such a focus may place limits on the potential development of our students as adult readers and learners.

These findings also raise more particular questions related to our educational practices that seem quite critical to consider if one is interested in promoting higher-level reading development. One key area for question is the very dichotomizing of reading into academic reading to complete tasks or to learn and personal reading for

enjoyment. That these can be merged as they seem to be for the mature reader suggests that the dichotomy is not inevitable. Why, then, do readers (along with reading teachers, researchers, and theorists) have this view of reading? What is it about how we think about reading and the school experience that might promote this specific compartmentalization of reading, or even the more general mutual exclusivity of effort and enjoyment in relation to school activities?

For example, considering that many participants so strongly identified their personal reading for enjoyment as passive, vicarious reception of stories, is it a good thing to encourage young readers that they should strive to "get lost in a book" when they want the best possible reading experience? Rosenblatt's (1978, 2004) view of the distinction between an efferent or learning-oriented and an aesthetic or immersive, experience-oriented reading stance still resonates strongly with those in the field who are concerned with how reading instructors model reading and motivate their students to become enthusiastic readers (e.g., Applegate & Applegate, 2004). However, such a view on the part of those who teach reading and who teach teachers of reading may also lead them to reinforce for their students the perceived boundary between task-like reading for information in school and passive reading for absorptive entertainment out of school that appears to be potentially problematic for the adult readers in this study.

In reading earlier work by Gray on reading development, I had been amused to see that he and other reading researchers at the time repeatedly emphasized that a diet only of story and fantasy was somehow unhealthy for children; he similarly placed strong emphasis on children broadening their personal reading interests as part

of a positive trajectory of reading development. Now I am not so amused, and I begin to see where that was coming from. The idealization of the experience of escape and passive uncritical immersion as the best that reading has to offer seems likely to hinder readers from being open to reading to learn, and to prevent them from embracing the idea of a critical stance as appropriate for all reading. It is comparable to the idea that the only real way to enjoy going to the theater would be to believe that everything happening on the stage is real, just as very young children do, and to become passively absorbed in that reality that is being created for you. The eagerness for immediacy of experience and the perception that such immediacy is essential for enjoyment of reading are problematic on many levels, most basically because they are a rejection of the self-consciousness and distancing that support more mature forms of deliberate learning from our experiences (e.g., Fox & Riconscente, 2008; Piaget, 1964/1968).

Another area for question is just how vested we are in the idea that students should be depending on school for their learning. The mature reader both as seen in this study and as captured by Gray and Rogers (1956) has an abiding openness to learning and a presumption that reading books is a way to pursue learning. If students come to believe that learning from text should happen only when they are in school, and perhaps even only with the support of the teacher who prepares learning experiences for them so as to make learning interesting and unthreatening and comfortable and relatively effortless, they will be limited as independent learners from text. Together with the restriction of learning to teacher-led school contexts, the idea that learning from text requires strong familiarity with or interest in the text

material could present strong obstacles to the development of students as independent, self-directed readers and learners outside of school. Further, the restriction of reading and learning to academics carries with it the larger implication that the vast majority of adults who do not pursue academic careers have open to them only on-the-job reading and reading for escape; their development as readers and learners is cut off at the point at which they left school, as is indeed implied in the theories of reading development offered by Chall (1983) and Alexander (1997, 2003a, 2003b, 2006).

A final area for question that comes up somewhat later in the developmental trajectory is the relative balance of costs and benefits of the type of training in being a critical reader that so many participants described as part of their socialization into higher academics. Although this acquisition of a critical lens is powerful and appropriate, does it necessarily occur in ways that shut down the possibility of openness? Does it tend to become a way of dismissing or appropriating what one reads, a learning in order to say something clever rather than learning in order to take risks and in order to grow?

On the other hand, the findings of this study suggest that there appear to be strong points of the school experience as well; younger students do get the exposure to many different types of texts and topics about which to learn that can support self-directed and independent learning, and they may have a valuable experience of text analysis that can open up possibilities for them of critical response to text, to author, and to literature. The possibility of sharing with others also appeared to be an important aim for some readers in this study, which seems promising as possibly

promoting deep and thoughtful reading and reflection on what was learned and why it had value.

Theoretical contributions. The argument that this study would be of theoretical value was based on the premise that there were certain identified inconsistencies or incoherencies among and across theories of reading development and research on competent and expert reading, and that investigating these from the standpoint of the articulated perspective on reading as a behavior would be helpful in parsing out the different pieces that were in conflict, and in getting to a more successfully unified view. Adopting a perspective on reading as a behavior was projected to allow the coherent discussion of multiple different ways of considering reading development, and to be an appropriately flexible and encompassing framework to support investigation of apparent inconsistencies or contradictory ways of construing competent reading. In a sense, therefore, carrying out this study was a test of whether the deliberate approach of beginning from such a framework could do the job it was claimed to be able to do, given how much groundwork it involved.

Without beginning from this broad framework, distinguishing and unifying the views of mature reading and competent reading that emerged would have been extremely difficult. Situating the investigation of higher reading development within the more traditional perspective on reading development as occurring primarily within school contexts positions the boundary between academic and personal reading as a defining aspect of reading development. This implies that the dichotomized view of reading is taken to be an essential truth about reading, and that reading is seen of being of a fundamentally different nature when it occurs for other-

directed learning as opposed to self-directed enjoyment. The association of schooled reading with school-based subject-matter learning, in turn, raises issues about the nature of reading as a domain, and the proper role of subject-matter knowledge and interest in supporting or facilitating learning from text. In this way, the existence of the both generally competent and the situationally reliant (and at the highest levels, expert) reader becomes problematic: how can the same path of schooled reading lead to these apparently contradictory forms of higher reading development? If reading is taken to be essentially a type of processing, these different forms of higher reading development become even harder to reconcile.

In the approach to reading as a form of cognitive processing that underlies much of the research undertaken in the last several decades, reading is initially divorced from its connection with behaviors and with human goals and intentions. In order to understand reading as a form of processing, it is necessary to pretend that how the reader thinks about reading can be put to the side for the moment; the personal mindset and rationale guiding the processing stand outside of this level of analysis. Taking reading as processing means fitting reading into a model in which certain cognitive operations are being done on a particular type of input, text, to produce an output, which can be taken variously to be such products of reading as comprehension, learning, or more generally, a problem solution. The aim is to standardize the description of these operations and fully specify the cause-effect links getting from input to output. When it turns out that even with the same input there may be different outputs, it becomes necessary to consider what other variables might be coming into play. One such variable is the situational factor of what type of output

is being aimed at. This is external to the processing, however, and invoked only in order to establish a controllable explanation for why different chains of operations might be initiated or completed for a given input.

What makes reading the same across situations is then that there is a family of described sets of operations that can account for the more or less successful progression from input to output for the particular type of input known as text. The reader initiates a particular chain of operations when situationally driven to pursue a specific goal or output, and competence in reading becomes having a full repertoire of such operations and being able to complete them successfully, that is, task completion.

However, the idea of reading for pleasure or enjoyment is very difficult to capture within this approach; other motivational factors such as topic interest or a broader interest in learning are also challenging to include. Taking this approach also means that in order to understand why different readers are differently successful in producing the same output from the same input, we need to introduce the reader's knowledge and also perhaps interest as external situational variables that affect both the type of operations initiated and the success of their completion. Once we do that, however, it becomes very difficult to understand how there could be readers who are generally successful across reading situations. Do knowledge and interest matter or do they not? From the cognitive processing perspective this is ideally a fairly black and white, yes or no type of question. If the answer taken to be more nuanced and interdependent, the knotty issue of for whom particular forms of knowledge and interest might matter decisively in a particular situation introduces complex

interactions of factors arising outside the level of processing that are difficult to grapple with in this approach.

In conjunction with the difficulties associated with using a cognitive processing approach to account for the natural complexities of reading as it actually occurs, it also appears that not only readers but also researchers and theorists have dichotomized reading. There is a long-standing and persistent separation of the path of reading development as fundamentally aiming at cultural and personal growth that considers the reading of adults who are beyond and outside of the school context (e.g., National Endowment for the Arts, 2007), and the path of reading development as aiming at academic task-completion that considers the reading of subject-matter experts (e.g., Chall, 1983). I am suggesting on the basis of the findings of this study (and with the further corroboration of these by the taxonomy of ways of reading developed by Berntsen and Larsen, 1996) that the view of reading development as involving increasing competence at academic task-completion has as its necessary converse the corresponding positioning of personal reading as only for escape. This view also entails the encapsulation of learning from text primarily within school subject-matter boundaries and therefore the identification of the highest form of reading as the reading of subject-matter experts, as described in the discussion of higher-order thinking in reading by Alexander and colleagues (2011). However, the broader view of reading forwarded here, which takes reading to be essentially the same behavior across school and personal contexts, or a unified view of reading, is what can support the view of reading as for personal growth and sustained pursuit of learning outside academia. This view of what adult reading can aim to be invokes the

willingness to expend effort and to read reflectively and critically in one's personal reading, together with the necessity of an orientation of openness to learning.

As a consequence of taking the initial stance toward reading as a complex communicative behavior adopted in this investigation, it appears now to be possible to do some untangling of the difficulties that emerged when different theories and views of reading were considered. The emergence of the phenomenon of mature reading as critical openness, as personal and instrumental, and as involving a unified view of reading gives strong support to the view that there does exist a trajectory of reading development in which reading is pursued for personal, transformative growth, and suggests the beginnings of an explanation for this in the reader's perception of the role of reading as transcending academic learning or schooled learning.

The difficulties with regard to generality or specificity of competent reading appear to be answerable by saying, yes, those both exist and are legitimate paths for reading development to take; in addition, one could be a reader of generally high competence and also become a specialized expert in a particular subject matter. Insofar as they are related to competence as schooled, the existence of these two paths echoes the larger issue of whether "good" learners are good with respect to their general learning approach and capability or only in response to specific types of learning situations (Alexander et al., 2011). It seems that one can get through school successfully either way, but the affordances offered by being able to read in general with high success make that path somewhat more desirable; however, if that is the path that we want all learners to take, we might have to delve deeper into what about such readers supports them motivationally and cognitively in doing such broad-

ranging and assimilative reading. Approaching this question from the standpoint of reading as a behavior may be more productive than revisiting it from within the framework of reading as cognitive processing, if only because we can in that way begin from the acknowledgement that this is what people do and then begin to explore it, rather than having to try to assemble this type of behavior as a pieced-together apparatus of operations, processes, and external factors and then to see if we can match it to what people actually do.

Finally, the findings of this study provide stronger empirical support than had previously been available for a number of important claims about reading and its development. In particular, Alexander and colleagues (2011) considered the nature of higher-order thinking in reading, and speculated that reading competence could take two paths: a general competence associated with an interest in learning from text and an awareness of the communicative nature of reading, which could map onto either the generally-competent reader or the mature reader as described here, depending on the degree of openness to learning that was present; and a situationally-reliant competence driven by subject-matter knowledge and interest, which in its most realized form would be the high competence of the subject-matter expert as reader. This description of higher-order thinking in reading arose within the context of a larger framing of higher-order thinking across and within domains that positioned it in relation to epistemic competence. The support that the findings of this study provide for these specific claims about higher-order thinking in reading therefore also reaches back to underpin as well the larger framework from which they originated,

and the identification of higher-order thinking with adaptive and consistent epistemic competence (Alexander et al., 2011).

Directions for future research. There are a number of directions for future research that could productively follow up on the stance provided by the perspective on reading adopted here, the specific line of inquiry followed by this investigation produced, and the particular findings produced. Three paths in particular suggest themselves as likely to be valuable in carrying this line of research forward: delving further into individual differences; expanding the timecourse of consideration of higher-level reading development to include the period immediately preceding and subsequent to graduate school; and expanding the scope of the communicative interaction addressed to encompass explicitly both reading and writing.

Understanding why people respond as they do in the reading situation and why they have the stance toward reading that they have involves consideration of individual differences. Adopting the perspective on reading taken here means approaching these individual differences as they connect to the behavior of reading as woven into the activities and pursuits of the reader's lived experiences and as they are driven by the reader's perceptions and understandings. For instance, one aspect of individual differences that has been a persistent question is the impact of different levels of topic knowledge and interest that readers bring to the reading situation. From the findings here, it appears that topic knowledge and topic interest are differently salient for different readers; this difference in the role of topic knowledge and topic interest may relate directly to what these readers are able to do as they read, but it may also relate importantly to what they think reading is supposed to be. For

example, some participants in this study responded in ways indicating that they saw reading as primarily about getting understanding and good reading as related to efficiency in processing. The type of effortful striving after meaning that they were apparently visualizing reading to involve would tend to suggest the need for situational supports such as strong knowledge or high interest, in order to get through the reading task.

Another type of individual difference that would be important to explore further is the degree of openness to learning that readers bring to their conception of reading and to the reading situation. Such openness could be a more extensive personality or dispositional factor that colors all of the individual's experiential interactions. It could be a more specific openness to learning, or even more specifically an openness to learning from the type of communicative interaction with text that is reading. And whichever of these it is, the type of openness we are interested in must also be capable of being maintained in conjunction with a critical and evaluative lens that permits the necessary distance to allow deliberate, reflective, and transformative learning.

A final important individual difference that was evident in the responses of participants in this study was self-confidence as a reader. High confidence in their ability to read anything, for instance, was expressed by several participants, who did then go on to read with active engagement and attention to message and text across the four passages. Less confidence was expressed by other participants, who did then go on to have difficulties with comprehension or with attention and effort across the four passages. Finally, there were participants who thought they understood well

as a rule and in this situation, but whose engagement was not effective or deep. What type of calibration does this suggest? Why are some readers correctly confident that they have understood, others correctly uncertain about their comprehension, and still others confident without warrant? As adults pursuing graduate study, these readers had had years and years of feedback on their reading; this makes it especially interesting to consider how such different metacognitive arrangements could have been arrived at, and how they each could provide an apparently functional platform to support the reading of these adults.

Another developmental issue is that many participants expressed the strong view that graduate school had changed them as readers. Every single one of them indicated an awareness that the reading that they do for graduate school requires active, effortful attention and the deployment of reading strategies. They were strongly agentic in their view of reading for school, in the sense that they knew that they had to be actively engaged in doing something in order to accomplish the type of reading at which they aimed. Many of them indicated that this was for them a very new type of reading; several who had completed master's degrees prior to entering a PhD program also noted that this was a different type of reading than had been required in their master's program. This raises the very interesting questions of exactly what this transition looks like, why it occurs at this point, and how it carries through to support the type of socializing into domain discourse described by Geisler (1994), along with the expert reading addressed extensively in the literature (e.g., Pressley & Afflerbach, 1995; Scardamalia & Bereiter, 1991). The investigation of these questions requires expanding the timecourse of higher-level reading

development to include the period immediately prior to graduate school and also immediately following it.

An additional expansion would also involve taking up the contribution of writing experiences to higher-level reading development, as has been already done by Scardamalia and Bereiter (1991) in their framing of literary expertise, and by Geisler (1994) in her extended investigation of expertise and academic literacy. While the investigation carried out was focused on the reader/reading side of the development of this communicative behavior, writing cannot be ignored as also implicated in that development, and did indeed emerge as a pervasive sub-theme in these data. The mention of sharing as an important goal of reading for several participants further highlights the very natural connection of reading with writing, and the very natural extension of reading as a communicative interaction from the more receptive side to also the productive side.

For instance, the importance, in this view of maturity of reading, of the reader's awareness of the author (emphasized also in the view of higher-order thinking in reading forwarded by Alexander and colleagues, 2011) is a clear indicator that readers must in some sense be thinking like an author. This could involve thinking about what they themselves might have to write about, as was evident in the case of Benjamin. It could involve thinking about the kind of writing challenges the writer was encountering and responding to in making the decisions that produced this particular piece of text, as was evident in the case of Frederick. And it could involve thinking about the author's context and situation, the intentionality and message that motivated the writing of the text and that provided the opportunity for an

argumentative or conversational interaction that could lead to a new way of thinking, as was evident in the case of Frances. All of these forms of awareness of the author imply a view of writing that in some sense parallels the view of reading being forwarded here. The investigation of how these views of reading and of writing may develop in parallel or independently, and the intersection of experiences with reading and experiences with writing, of understandings of reading and understandings of writing, and most critically, of self-perceptions as a reader and self-perceptions as a writer, is an important and valuable direction for future research.

Taking up any of these lines of research means taking seriously the importance of knowing more about different paths into adult reading and different trajectories of reading development. Knowledge about these different paths and trajectories will have implications for education insofar as we aim at the shaping of literate individuals who are critical and engaged readers of complex, challenging texts and can read for learning and for personal growth. The current, expertise-related focus on which our view of adult reading is based misses much of importance for and about adult readers. We do not yet know much about how students move as readers from high school into college, from undergraduate experience into graduate school, and from any of these into adult life.

APPENDICES**Appendix A: Demographics**

DIRECTIONS: Please circle or fill in the appropriate responses.

1. GENDER: Male Female

2. AGE: _____

3. ETHNICITY (check all census bureau categories that apply):

_____ Non-Hispanic White

_____ Hispanic

_____ Black

_____ American Indian

_____ Asian/Pacific Islander

_____ Other (Please specify: _____)

4. LANGUAGE BACKGROUND:

If English is not your first language, please indicate the language in which you first learned to read: _____

5. GRADUATE DEGREE PROGRAM:

_____ MA

_____ MS

_____ PhD

_____ Other (Please specify: _____)

6. NUMBER OF YEARS OF GRADUATE STUDY COMPLETED: _____

7. DEPARTMENT: _____

8. SPECIALIZATION OR AREA(S) OF INTEREST:

Appendix B: Structured Interview

Pilot Study

Reading Background

I'd like to know about your background as a reader, so I have a few questions about that.

1. What do you remember about learning to read?
2. What was your experience with reading like in elementary school? How about after that?
3. What was your experience with reading that you did out of school when you were a child? How about after that?
4. Do you think you've changed as a reader over time, or do you think you've stayed pretty much the same? Why?

Current Reading Status

I'd also like to know about how you are as a reader now.

5. How would you describe your current reading habits?
6. What do you typically read for school or work? How about for your own purposes? Why do you read that?
7. How much time do you typically spend reading for school or work? How about for your own purposes?
8. How interested would you say you are in reading? Why?
9. How important would you say reading is for you? Why?
10. Do you have any particular strengths or weaknesses as a reader?

Understandings of Reading

Another thing I'm interested in finding out about is what you think you do when you read.

11. How would you describe what you do when you're reading? Is there work involved? Are there differences in different situations?

12. Is there anything you think you know about reading? How and when did you learn that?

13. What do you think it means to be a good reader?

Reader Profiles

Finally, I have 12 short descriptions of various types of readers, and I'd like you to read them over and tell me which one you think fits you the closest. Take as long as you need to read them, and you can ask me any questions you may have as you go.

When you're ready, let me know.

14. What about the one you picked seems like a good match? Is there anything about it that doesn't fit quite as well?

15. Are there any other profiles that you consider to be a relatively close fit? What about them was a good match and where did they not fit so well?

16. And was there any profile that you knew right away wasn't a good fit? Why?

17. Would any of the profiles have fit you better at another point in your life? Would any of the profiles fit you better in a particular reading situation or context?

18. And finally, is there anything else you'd like to tell me about reading or about yourself as a reader?

The Study

Reading Background

I'd like to know about your background as a reader, so I have a few questions about that.

1. What do you remember about learning to read?
2. a. What were your experiences with reading like in elementary school? b. How about after that?
3. a. What were your experiences with reading that you did out of school when you were a child? b. How about after that?
4. a. Do you think you've changed as a reader over time, or do you think you've stayed pretty much the same? b. Why?

Current Reading Status

I'd also like to know about how you are as a reader now.

5. How would you describe your current reading habits?
6. a. What do you typically read for school or work? b. How about for your own purposes? c. Why do you read that?
7. a. How much time do you typically spend reading for school or work? b. How about for your own purposes?
8. a. How interested would you say you are in reading? b. Why?
9. a. How important would you say reading is for you? b. Why?

Understandings of Reading

Another thing I'm interested in finding out about is your own understandings of reading.

10. a. How would you describe what you do when you're reading? b. Is there work involved? c. Are there differences in different situations?

11. a. Is there anything you think you know about reading? b. How and when did you learn that?

12. What do you think it means to be a good reader?

Self-Perception as Reader

Another I'd like to know about is how you view yourself as a reader.

13. How would you describe yourself as a reader?

14. Do you have any particular strengths or weaknesses as a reader?

15. Do you have any particular interests as a reader?

16. Do you approach reading with any particular attitude?

17. a. What do you aim at when you read? b. Is it different in different situations?

18. And finally, is there anything else you'd like to tell me about reading or about yourself as a reader?

Appendix C: Reader Profile Descriptions

Pilot Study

Reader Profile Descriptions

These reader profile descriptions are based on characterizations of different types of competent readers that have been offered by reading researchers and theorists.

Please read them and choose the one that best describes you as a reader.

1. This reader has good concentration, ability to read between and beyond the lines and to think creatively with minimum prompts, good writing skills, and engages in critical analysis and concept formation. This reader has eclectic reading interests, and is confident and comfortable with conventional school culture.
2. This reader actively questions while reading, but it is difficult for this reader to pay attention while reading unless engaging in active, pencil-in-hand reading. This reader has interests including business, social studies, and the mechanics of how things work, and prefers to read for pragmatic purposes.
3. This reader has strong basic reading comprehension and flexibility of reading rate, but finds writing difficult, and tends to read literally without going into depth or considering the implications of what is read. This reader is interested primarily in reading fiction, and engages in leisure reading for escape and comfort.
4. This reader has principled knowledge about reading, and can read well for both literal comprehension and in response to more complex or deeper reading demands. This reader enjoys reading and has wide-ranging interests that have supported the development of a broad base of knowledge from wide reading on a variety of topics.

5. This reader is strongly goal-directed and willing to expend high levels of strategic effort in the pursuit of understanding or satisfactory performance, even when confronted by difficult text or limited topic knowledge. This reader values reading, but must work hard to build understanding in many cases.
6. This reader reflects about what is read, reads with close attention to the text, and accumulates facts and other details, but can find some difficulty in bringing together multiple viewpoints or conflicting accounts. This reader reads successfully in academic reading related to building up a store of subject-matter knowledge.
7. This reader reads efficiently complex materials on a wide variety of topics and from a variety of viewpoints, and, while open to the different views presented, also maintains a skeptical outlook. This reader reads broadly, and is more concerned with patterns and relationships in the individual texts than with details or facts.
8. This reader has broad content knowledge, high efficiency in reading, and high confidence, and engages readily in synthesis, reorganization, and critical reaction to what is read in often difficult or contradictory texts. This reader seeks to build integrated knowledge from the multiple texts that are read.
9. This reader has high competence in reading, and is readily able to grasp and interpret meanings, to react to what is read, and to apply the ideas deriving from reading. This reader has strong reading interests, a strong identity as a reader, and reads both for pleasure and for personal growth.
10. This reader has strong knowledge about reading developed from reflection upon his or her own extensive reading experiences, and great interest in reading. This

reader reads actively and constructively, and thinks of reading as a participatory and communicative activity inviting a conversational or argumentative interaction.

11. This reader has strong knowledge of a particular academic subject-matter, and reads with high confidence and competence in that subject-matter, questioning, arguing, elaborating, and evaluating using appropriate criteria. This reader reads widely and deeply within that subject-matter from interest and to support knowledge-building.

12. This reader has strong interpretive capability, and is willing to work at even difficult text requiring slow reading or rereading. This reader concentrates on the quality and structure of the aesthetic experience arising from reading, attending to the feelings, emotions, and sensations aroused by the text.

Appendix D: Knowledge and Interest Evaluation

Each of the 27 items presents the beginning of an entry from the first edition of the *Encyclopædia Britannica* (1768-1771).

For each item, please read the beginning of the entry and then evaluate your likely level of knowledge of the content presented in the entry along with your projected level of interest in reading the rest of this entry from the first edition of the *Encyclopædia Britannica*.

Circle the letter best corresponding to your likely level of knowledge/interest.

1. ABRIDGEMENT, in literature, a term signifying the reduction of a book into a smaller compass.—The art of conveying much sentiment in few words is the happiest talent an author can be possessed of. This talent is peculiarly necessary in the present state of literature; for many writers have acquired the dexterity of spreading a few critical thoughts over several hundred pages. When an author hits upon a thought that pleases him, he is apt to dwell upon it, to view it in different lights, to force it in improperly, or upon the slightest relations.

- (a) Know **some or much** — Have **some or high** interest in reading the entry
- (b) Know **some or much** — Have **little or no** interest in reading the entry
- (c) Know **little or nothing**— Have **some or high** interest in reading the entry
- (d) Know **little or nothing**— Have **little or no** interest in reading the entry

2. ASTRONOMY – *Of ASTRONOMY in general.* By astronomy we discover that the earth is at so great a distance from the sun, that if seen from thence it would appear no bigger than a point, although its circumference is known to be 25, 020 miles. Yet that distance is so small, compared with the earth's distance from the fixed stars, that if the orbit in which the earth moves round the sun were solid, and seen from the nearest star, it would likewise appear no bigger than a point...

- (a) Know **some or much** — Have **some or high** interest in reading the entry
- (b) Know **some or much** — Have **little or no** interest in reading the entry
- (c) Know **little or nothing**— Have **some or high** interest in reading the entry
- (d) Know **little or nothing**— Have **little or no** interest in reading the entry

3. FIRE, a general name, by which men seem to understand a certain sensation or complex notion of light, heat, burning, melting, &c. The power of fire is so great, its effects so extensive, and the manner of its acting so wonderful, that some of the wisest nations of old revered and worshipped it, as the supreme deity. Some of the chemists also, after they had discovered its surprising operations, suspected it to be an uncreated being: and indeed the most famous of them have acknowledged it as the source of all their knowledge...

- (a) Know **some or much** — Have **some or high** interest in reading the entry
- (b) Know **some or much** — Have **little or no** interest in reading the entry
- (c) Know **little or nothing**— Have **some or high** interest in reading the entry
- (d) Know **little or nothing**— Have **little or no** interest in reading the entry

4. GARDENING, a branch of agriculture, containing the cultivation of gardens. The simplest idea of a garden, is that of a spot embellished with a number of natural objects, trees, walks, polished parterres, flowers, streams, &c. One more complex comprehends statues and buildings, that nature and art may be mutually ornamental. A third approaching nearer perfection, is of objects assembled together, in order to produce, not only an emotion of beauty, essential to every garden, but also some other particular emotion, grandeur for example, or gaiety.

- (a) Know **some or much** — Have **some or high** interest in reading the entry
- (b) Know **some or much** — Have **little or no** interest in reading the entry
- (c) Know **little or nothing**— Have **some or high** interest in reading the entry
- (d) Know **little or nothing**— Have **little or no** interest in reading the entry

5. MEDICINE is generally defined to be, The art of preserving health when present, and of restoring it when lost. Men would never think of any particular regimen or mode of living in order to preserve health, before they felt the pains which accompany the want of it. The first painful sensation must necessarily have produced a desire for relief. But in a period when physicians and medicines were equally unknown, how was that relief to be obtained? or what system of conduct would man in this situation naturally follow?

- (a) Know **some or much** — Have **some or high** interest in reading the entry
- (b) Know **some or much** — Have **little or no** interest in reading the entry
- (c) Know **little or nothing**— Have **some or high** interest in reading the entry
- (d) Know **little or nothing**— Have **little or no** interest in reading the entry

6. MYTHOLOGY. The word *mythology* is a Greek compound, that signifies a *discourse on fables*; and comprehends, in a collective sense, all the fabulous and poetic history of pagan antiquity. It follows, therefore, that this science teaches the history of the gods, demi-gods, and fabulous heroes of antiquity; the theology of the pagans, the principles of their religion, their mysteries, metamorphoses, oracles, &c. If we well consider the matter, we shall find, that there were, in pagan antiquity, three different religions, First, That of the philosophers...

- (a) Know **some or much** — Have **some or high** interest in reading the entry
- (b) Know **some or much** — Have **little or no** interest in reading the entry
- (c) Know **little or nothing**— Have **some or high** interest in reading the entry
- (d) Know **little or nothing**— Have **little or no** interest in reading the entry

7. PAINTING, the art of representing natural bodies, and giving them an appearance of life, by the turn of lines, and the degrees of colours. Whosoever would apply himself to painting, says Leonardo da Vinci, must in the first place learn perspective: this will enable him to dispose things in their proper places, and to give the due dimensions to each: having done this, he must learn to design; chusing for that purpose some able master, who at the same time may give him some insight into the colours of figures...

- (a) Know **some or much** — Have **some or high** interest in reading the entry
- (b) Know **some or much** — Have **little or no** interest in reading the entry
- (c) Know **little or nothing**— Have **some or high** interest in reading the entry
- (d) Know **little or nothing**— Have **little or no** interest in reading the entry

8. LOGIC, *Of REASONING*. All the aims of human reason may be reduced to these two: 1. To rank things under those universal ideas to which they truly belong; and, 2. To ascribe to them their several attributes and properties in consequence of that distribution. One great aim of human reason is, to determine the genera and species of things. Now, as in universal propositions we affirm some property of a genus or species, it is plain, that we cannot apply this property to particular objects, till we have first determined...

- (a) Know **some or much** — Have **some or high** interest in reading the entry
- (b) Know **some or much** — Have **little or no** interest in reading the entry
- (c) Know **little or nothing**— Have **some or high** interest in reading the entry
- (d) Know **little or nothing**— Have **little or no** interest in reading the entry

9. SILK, is properly an animal fluid, hardened by the air; being an extremely soft and glossy thread, spun by the silk worm, the body of which consists of eleven rings. The humours found in the body of this insect approach to the nature of silk; since, on being rubbed in the hand, they leave a solid crust behind. In the sides of the belly, all about the ventricle, there are deposited a vast number of vessels, which contain the silky juice: these run with various windings and meanders to the mouth...

- (a) Know **some or much** — Have **some or high** interest in reading the entry
- (b) Know **some or much** — Have **little or no** interest in reading the entry
- (c) Know **little or nothing**— Have **some or high** interest in reading the entry
- (d) Know **little or nothing**— Have **little or no** interest in reading the entry

10. ALGEBRA is a general method of computation by certain signs and symbols, which have been contrived for this purpose, and found convenient. It is called an Universal Arithmetic, and proceeds by operations and rules similar to those in common arithmetic, founded upon the same principles. But as a number of symbols are admitted into this science, being necessary for giving it that extent and generality which is its greatest excellence, the import of those symbols must be clearly stated. In geometry, lines are represented by a line, triangles by a triangle...

- (a) Know **some or much** — Have **some or high** interest in reading the entry
- (b) Know **some or much** — Have **little or no** interest in reading the entry
- (c) Know **little or nothing**— Have **some or high** interest in reading the entry
- (d) Know **little or nothing**— Have **little or no** interest in reading the entry

11. BEAUTY, in its native signification, is appropriated to objects of sight. Objects of the other senses may be agreeable, such as the sounds of musical instruments, the smoothness and softness of some surfaces; but the agreeableness called beauty belongs to objects of sight. Objects of sight are more complex than those of any other sense: In the simplest, we perceive colour, figure, length, breadth, thickness. A tree is composed of a trunk, branches, and leaves; it has colour, figure, size, and sometimes motion: By means of each of these particulars, separately considered, it appears beautiful...

- (a) Know **some or much** — Have **some or high** interest in reading the entry
- (b) Know **some or much** — Have **little or no** interest in reading the entry
- (c) Know **little or nothing**— Have **some or high** interest in reading the entry
- (d) Know **little or nothing**— Have **little or no** interest in reading the entry

12. FROST, in physiology, such an excessively cold state of the air as converts watery fluids into ice. In very cold snowy weather, not only water, but urine, beer, ale, milk, vinegar, and even wine, are either wholly or in part converted into ice, though the last but slowly. As to the freezing of expressed oils, a very intense cold may deprive them of their fluidity, so as to be capable of being cut into portions of any figure; but whether they are convertible into real ice, is not yet determined.

- (a) Know **some or much** — Have **some or high** interest in reading the entry
- (b) Know **some or much** — Have **little or no** interest in reading the entry
- (c) Know **little or nothing**— Have **some or high** interest in reading the entry
- (d) Know **little or nothing**— Have **little or no** interest in reading the entry

13. MECHANICS – *Attraction of gravitation* is that power by which different bodies tend towards one another. Of this we have daily instances in the falling of bodies to the earth. By this power in the earth it is, that bodies, on whatever side, fall in lines perpendicular to its surface; and consequently, on opposite sides, they fall in opposite directions; all towards the centre, where the force of gravity is as it were accumulated; and by this power it is, that bodies on the earth's surface are kept to it on all sides.

- (a) Know **some or much** — Have **some or high** interest in reading the entry
- (b) Know **some or much** — Have **little or no** interest in reading the entry
- (c) Know **little or nothing**— Have **some or high** interest in reading the entry
- (d) Know **little or nothing**— Have **little or no** interest in reading the entry

14. LANGUAGE, in the most general meaning of the word, signifies any sound uttered by an animal, by which it expresses any of its passions, sensations, or affections; but it is more particularly understood to denote those various modifications of the human voice, by which the several sensations and ideas of one man are communicated to another. Nature has endowed every animal with powers sufficient to communicate with others of the same species some of its sensations and desires. The organs of most animals are so formed, as readily to perceive and understand...

- (a) Know **some or much** — Have **some or high** interest in reading the entry
- (b) Know **some or much** — Have **little or no** interest in reading the entry
- (c) Know **little or nothing**— Have **some or high** interest in reading the entry
- (d) Know **little or nothing**— Have **little or no** interest in reading the entry

15. CHEMISTRY, *The ANALYSIS of MINERAL SUBSTANCES*. MINERALS differ greatly from vegetables, and from animals; they are not near so complex as those organized bodies, and their principles are much more simple; whence it follows, that these principles are much more closely connected, and that they cannot be separated without the help of fire; which not having on their parts the same action and the same power as on organized bodies, hath not the same ill effect on them; we mean the effect of changing their principles, or even destroying them entirely.

- (a) Know **some or much** — Have **some or high** interest in reading the entry
- (b) Know **some or much** — Have **little or no** interest in reading the entry
- (c) Know **little or nothing**— Have **some or high** interest in reading the entry
- (d) Know **little or nothing**— Have **little or no** interest in reading the entry

16. NEEDLE, a very common little instrument or utensil, made of steel, pointed at one end, and pierced at the other, used in sewing embroidery, tapestry, &c. Needles make a very considerable article in commerce, though there is scarce any commodity cheaper, the consumption of them being almost incredible. The sizes are from n^o 1, the largest, to n^o 25, the smallest. In the manufacture of needles, German and Hungarian steel are of most repute. In the making of them, the first thing is to pass the steel through a coal fire, and under a hammer...

- (a) Know **some or much** — Have **some or high** interest in reading the entry
- (b) Know **some or much** — Have **little or no** interest in reading the entry
- (c) Know **little or nothing**— Have **some or high** interest in reading the entry
- (d) Know **little or nothing**— Have **little or no** interest in reading the entry

17. PAPER. The method of making paper of linen or hempen-rags, is as follows. The linen-rags being carried to the mill, are first sorted, then washed very clean in puncheons, whose sides are grated with strong wires, and the bottoms bored full of holes. After this, they are fermented, by laying them in heaps close covered with sacking, till they sweat and rot, which is commonly done in four or five days. When duly fermented, they are twisted into handfuls, cut small, and thrown into oval mortars.

- (a) Know **some or much** — Have **some or high** interest in reading the entry
- (b) Know **some or much** — Have **little or no** interest in reading the entry
- (c) Know **little or nothing**— Have **some or high** interest in reading the entry
- (d) Know **little or nothing**— Have **little or no** interest in reading the entry

18. AGRICULTURE – *Of the Food of Plants*. It is thought to be an important question in agriculture, whether the several kinds of plants require the same, or different nourishment. Upon a superficial view of this question, it would appear very improbable, that the same matter could nourish such a variety of plants, differing so essentially in smell, taste, figure, &c. Much, however, may depend upon the internal structure and arrangement of the vessels. One thing is certain, that if the vessels in any plant be uncommonly small, parts will be rejected by that plant...

- (a) Know **some or much** — Have **some or high** interest in reading the entry
- (b) Know **some or much** — Have **little or no** interest in reading the entry
- (c) Know **little or nothing**— Have **some or high** interest in reading the entry
- (d) Know **little or nothing**— Have **little or no** interest in reading the entry

19. GRAMMAR, Of UNIVERSAL GRAMMAR. It is not necessary here to inquire how language was originally invented, to trace the various changes it may have undergone, or to examine whether any one language may be considered as the original from which all others have been derived; it is sufficient for our purpose to observe, that all mankind, however diversified in other respects, agree in the common use of language; from which it appears, that language is not merely accidental and arbitrary, but founded in the nature of things, and within the reach of all mankind.

- (a) Know **some or much** — Have **some or high** interest in reading the entry
- (b) Know **some or much** — Have **little or no** interest in reading the entry
- (c) Know **little or nothing**— Have **some or high** interest in reading the entry
- (d) Know **little or nothing**— Have **little or no** interest in reading the entry

20. ANABAPTISTS, a sect or denomination of Christians, who deduce their original from the apostolic age. This name was given them by their opponents, soon after the Reformation, by way of scorn, and imports *rebaptizing*; but this charge they disclaim, by denying that the sprinkling, or pouring of water, upon infants, has any relation at all to the scripture-ordinance of baptism, either as to its subjects or mode. Though they believe the salvation of elect infants; yet they deny their being the proper subjects of baptism: Because they can find neither precept nor example...

- (a) Know **some or much** — Have **some or high** interest in reading the entry
- (b) Know **some or much** — Have **little or no** interest in reading the entry
- (c) Know **little or nothing**— Have **some or high** interest in reading the entry
- (d) Know **little or nothing**— Have **little or no** interest in reading the entry

21. BRIDGE, a work of masonry or timber, consisting of one or more arches, built over a river, canal, or the like, for the convenience of crossing the same. Bridges are a sort of edifices very difficult to execute, on account of the inconvenience of laying foundations, and walling under water. The parts of a bridge are the piers, the arches; the pavement, or way over for cattle and carriages; the foot-way on each side, for foot passengers; the rail or parapet, which incloses the whole; and the butments or ends of the bridge...

- (a) Know **some or much** — Have **some or high** interest in reading the entry
- (b) Know **some or much** — Have **little or no** interest in reading the entry
- (c) Know **little or nothing**— Have **some or high** interest in reading the entry
- (d) Know **little or nothing**— Have **little or no** interest in reading the entry

22. HATCHING, the maturing fecundated eggs, whether by the incubation and warmth of the parent-bird, or by artificial heat, so as to produce young chickens alive. The art of hatching chickens by means of ovens has long been practiced in Egypt; but it is there only known to the inhabitants of a single village named Berme, and to those that live at a small distance from it. Towards the beginning of autumn they scatter themselves all over the country, where each person among them is ready to undertake the management of an oven...

- (a) Know **some or much** — Have **some or high** interest in reading the entry
- (b) Know **some or much** — Have **little or no** interest in reading the entry
- (c) Know **little or nothing**— Have **some or high** interest in reading the entry
- (d) Know **little or nothing**— Have **little or no** interest in reading the entry

23. MORAL PHILOSOPHY – Duties to Society – *Concerning Marriage*. When a man arrives to a certain age, he becomes sensible of a peculiar sympathy and tenderness towards the other sex; the charms of beauty engage his attention, and call forth new and softer dispositions than he has yet felt. The many amiable qualities exhibited by a fair outside, or by the mild allurements of female manners, or which the prejudiced spectator without much reasoning supposes those to include, with several other circumstances, point his view and affection to a particular object...

- (a) Know **some or much** — Have **some or high** interest in reading the entry
- (b) Know **some or much** — Have **little or no** interest in reading the entry
- (c) Know **little or nothing**— Have **some or high** interest in reading the entry
- (d) Know **little or nothing**— Have **little or no** interest in reading the entry

24. LAW, *Of Minors and their Tutors and Curators*. The law concerning the state of children falls next to be explained. Children are either born in wedlock, or out of it. All children, born in lawful marriage or wedlock, are presumed to be begotten by the person to whom the mother is married; and consequently to be lawful children. The presumption is so strongly founded, that it cannot be defeated but by direct evidence that the mother's husband could not be the father of the child, *e. g.* where he is impotent, or was absent...

- (a) Know **some or much** — Have **some or high** interest in reading the entry
- (b) Know **some or much** — Have **little or no** interest in reading the entry
- (c) Know **little or nothing**— Have **some or high** interest in reading the entry
- (d) Know **little or nothing**— Have **little or no** interest in reading the entry

25. MORAL PHILOSOPHY – Duties to Society – *Of Parental Duty*. The connection of parents with their children is a natural consequence of the matrimonial connection, and the duties which they owe them result as naturally from that connection. The feeble state of children, subject to so many wants and dangers, requires their incessant care and attention; their ignorant and uncultivated minds demand their continual instruction and culture. Had human creatures come into the world with the full strength of men, and the weakness of reason and vehemence of passion which prevail in children...

- (a) Know **some or much** — Have **some or high** interest in reading the entry
- (b) Know **some or much** — Have **little or no** interest in reading the entry
- (c) Know **little or nothing**— Have **some or high** interest in reading the entry
- (d) Know **little or nothing**— Have **little or no** interest in reading the entry

26. AGRICULTURE – *Of the culture of Potatoes*. The potatoe is one of the most useful roots that are cultivated in this country, and is raised in a very different manner from any of the other roots. It has a number of eyes in it, each of which produce a separate plant. The largest potatoes are the best for seed: because, when cut according to the eyes, and properly sown, the plants are not in danger of crowding each other. The plant sends out roots in every direction to a considerable distance...

- (a) Know **some or much** — Have **some or high** interest in reading the entry
- (b) Know **some or much** — Have **little or no** interest in reading the entry
- (c) Know **little or nothing**— Have **some or high** interest in reading the entry
- (d) Know **little or nothing**— Have **little or no** interest in reading the entry

27. SACRIFICE, a solemn act of religious worship, which consisted in dedicating or offering up something animate or inanimate upon an altar, by the hands of the priest, either as an expression of gratitude to the Deity for some signal mercy, or to acknowledge their dependance on him, or to conciliate his favour. The origin of sacrifice is by some attributed to the Phoenicians, but Porphyry ascribes it to the Egyptians, who first offered the first-fruits of their grounds to the gods, burning them upon an altar of turf...

- (a) Know **some or much** — Have **some or high** interest in reading the entry
- (b) Know **some or much** — Have **little or no** interest in reading the entry
- (c) Know **little or nothing**— Have **some or high** interest in reading the entry
- (d) Know **little or nothing**— Have **little or no** interest in reading the entry

Appendix E: Sample Passage

Oriental sample passage from the first edition of the *Encyclopædia*

***Britannica* (1768-1771).**

HELL, the place of divine punishment after death.

As all religions have supposed a future state of existence after this life; so all have their hell or place of torment, in which the wicked are supposed to be punished. The hell of the ancient heathens was divided into two mansions; the one called elysium, on the right hand, pleasant and delightful, appointed for the souls of good men; the other called tartara, on the left, a region of misery and torment, appointed for the wicked. The latter only was hell, in the present restrained sense of the word.

The philosophers were of opinion, that the infernal regions were at an equal distance from all the parts of the earth; nevertheless it was the opinion of some, that there were certain passages which led thither, as the river Lethe near the Syrtes, and the Acherusian cave in Epirus. At Hermione it was thought, that there was a very short way to hell; for which reason the people of that country never put the fare into the mouths of the dead to pay their passage.

The Jews placed hell in the centre of the earth, and believed it to be situated under waters and mountains. According to them, there are three passages leading to it: the first is in the wilderness, and by that Korah, Dathan, and Abiram descended into hell; the second is in the sea, because Jonah, who was thrown into the sea, cried to God out of the belly of hell; the third is in Jerusalem, because it is said the fire of the Lord is in Zion, and his furnace is in Jerusalem. They likewise acknowledged seven degrees of pain in hell, because they find this place called by seven different

names in scripture. Though they believed that infidels, and persons eminently wicked, will continue for ever in hell; yet they maintained, that every Jew who is not infected with some heresy, and has not acted contrary to the points mentioned by the rabbins, will not be punished therein for any other crimes above a year in hell.

The Mahometans believe the eternity of rewards and punishments in another life. In the Koran it is said, that hell has seven gates, the first for the Mussulmans, the second for the Christians, the third for the Jews, the fourth for the Sabians, the fifth for the Magians, the sixth for the pagans, and the seventh for the hypocrites of all religions.

Among Christians, there are two controverted questions in regard to hell; the one concerns locality, and other the duration of its torments. The locality of hell, and the reality of its fire, began first to be controverted by Origen. That father, interpreting the scripture account metaphorically, makes hell to consist not in external punishments, but in a consciousness or sense of guilt, and a remembrance of past pleasures. Among the moderns, Mr. Whiston advanced a new hypothesis. According to him, the comets are so many hells appointed in their orbits alternately to carry the damned into the confines of the sun, there to be scorched by the violent heat, and then to return with them beyond the orb of Saturn, there to starve them in these cold and dismal regions. Another modern author, not satisfied with any hypothesis hitherto advanced, assigns the sun to be the local hell. As to the second question, *viz.* the duration of hell-torments, we have Origen again at the head of those who deny that they are eternal; it being that father's opinion, that not only men, but devils, after a due course of punishment suitable to their respective crimes, shall be pardoned and

restored to heaven. The chief principle upon which Origen built his opinion, was the nature of punishment, which he took to be emendatory, applied only as a physic for the recovery of the patient's health. The chief objection to the eternity of hell torments among modern writers, is the disproportion between temporary crimes and eternal punishments. Those who maintain the affirmative, ground their opinions on scripture accounts, which represent the pain of hell under the figure of a worm which never dies, and a fire which is not quenched; as also upon the words, "These shall go away into everlasting punishment, but the righteous into life eternal."

from:

Smellie, W. (Ed.). (1768-1771). *Encyclopædia Britannica* (Vols. I-III). Edinburgh, Scotland: Bell & Macfarquhar.

Appendix F: Encyclopedia Entries

All entries are from:

Smellie, W. (Ed.). (1768-1771). *Encyclopædia Britannica* (Vols. I-III). Edinburgh, Scotland: Bell & Macfarquhar.

1. ABRIDGEMENT, in literature, a term signifying the reduction of a book into a smaller compass.—The art of conveying much sentiment in few words is the happiest talent an author can be possessed of. This talent is peculiarly necessary in the present state of literature; for many writers have acquired the dexterity of spreading a few critical thoughts over several hundred pages. When an author hits upon a thought that pleases him, he is apt to dwell upon it, to view it in different lights, to force it in improperly, or upon the slightest relations. Though this may be pleasant to the writer, it tires and vexes the reader. There is another great source of diffusion in composition. It is a capital object with an author, whatever be the subject, to give vent to all his best thoughts. When he finds a proper place for any of them, he is peculiarly happy. But, rather than sacrifice a thought he is fond of, he forces it in by way of digression, or superfluous illustration. If none of these expedients answer his purpose, he has recourse to the margin, a very convenient apartment for all manner of pedantry and impertinence. There is not an author, however correct, but is more or less faulty in this respect. An abridger, however, is not subject to those temptations. The thoughts are not his own; he views them in a cooler and less affectionate manner; he discovers an impropriety in some, a vanity in others, and a want of utility in many. His business, therefore, is to retrench superfluities, digressions, quotations, pedantry, &c. and to lay before the public only what is really useful. This is by no means an

easy employment: To abridge some books, requires talents equal, if not superiour, to those of the author. The facts, manner, spirit, and reasoning, must be preserved; nothing essential, either in argument or illustration, ought to be omitted. The difficulty of the task is the principal reason why we have so few good abridgements: Wynne's abridgement of Locke's Essay on the Human Understanding is, perhaps, the only unexceptionable one in our language.

These observations relate solely to such abridgements as are designed for the public. But,

When a person wants to set down the substance of any book, a shorter and less laborious method may be followed. It would be foreign to our plan to give examples of abridgements for the public: But, it may be useful for young people, to know how to abridge books for their own use.

Read the book carefully; endeavour to learn the principal view of the author; attend to the arguments employed: When you have done so, you will generally find, that what the author uses as new or additional arguments, are in reality only collateral ones, or extensions of the principal arguments. Take a piece of paper, or a commonplace book, put down what the author wants to prove, subjoin the argument or arguments, and you have the substance of the book in a new form.

Making private abridgements of this kind has many advantages; it engages us to read with accuracy and attention; it fixes the subject in our minds; and, if we should happen to forget, instead of reading the books again, by glancing a few lines, we are not only in possession of the chief arguments, but recall in a good measure the author's method and manner.

Abridging is peculiarly useful in taking the substance of what is delivered by Professors, &c. It is impossible, even with the assistance of short-hand, to take down, *verbatim*, what is said by a public speaker. Besides, although it were practicable, such a talent would be of little use. Every public speaker has circumlocutions, redundancies, lumber, which deserve not to be copied. All that is really useful may be comprehended in a short compass. If the plan of the discourse, and arguments employed in support of the different branches be taken down, you have the whole. These you may afterwards extend in the form of a discourse dressed in your own language. This would not only be a more rational employment, but would likewise be an excellent method of improving young men in composition, an object too little attended to in all our universities. Besides, it would be more for the honour of professors; as it would prevent at least such immense loads of disjointed and unintelligible rubbish from being handed about by the name of such a man's lectures.

2. AGRICULTURE

Of the culture of Potatoes.

The potatoe is one of the most useful roots that are cultivated in this country, and is raised in a very different manner from any of the other roots. It has a number of eyes in it, each of which produce a separate plant. The largest potatoes are the best for seed: because, when cut according to the eyes, and properly sown, the plants are not in danger of crowding each other. The plant sends out roots in every direction to a considerable distance, and upon these the potatoes are formed.

There are several kinds both of the white and red potatoes. They succeed best in a light dry soil; and though there be but a small mixture of loam in it, if tolerably rich and properly cultivated, it seldom fails to produce a good crop. But a good crop is not to be expected from a stiff wet soil, unless it be laid up in ridges so as to make it dry, and a considerable quantity of dung laid on to render it open.

When the crop of potatoes is the chief point in view, the land should have a ploughing before winter, especially if the soil be not very free and open. If dung be necessary, the proper time for laying it on is before this ploughing. When the potatoes are to be planted, which may be done any time in March or beginning of April, the land must again be ploughed in narrow furrows, but if the land be open and very loose, they may be dropped into every furrow; and as the plough opens the furrow for the second row, it buries the first row at a proper depth. The furrow should not be very deep; and two horses are sufficient. It is better in this case to make the horses go a-breast than in a line; because, as one of them only goes in the

furrow, the potatoes are not so liable to be hurt or displaced. This method of planting them by the plough is greatly preferable to the dibble or planting-stick.

When a small quantity is intended to be cultivated, they may be planted with the spade. A small cross-trench or furrow should be opened with the spade at the end of the ridge. Into this furrow drop the potatoes at proper distances; and in making the next furrow, the roots laid in the first will be covered in the same measure as done by the plough.

According to the distance of the rows made by the plough, the distance of the plants in the rows should be regulated: One plant in a square foot is sufficient to allow them to be properly hoed. When planted in every second furrow ploughed narrow, the rows will be about 12 or 14 inches asunder. The plants may be placed at the same distance in the rows.

It is unnecessary to harrow the land after the potatoes are planted: This operation may be delayed till the weeds appear, which gives the farmer an opportunity of destroying them without any additional labour. Tho' potatoes be planted early in the spring, or even before winter, they do not come up till May. Before that time the weeds are far advanced; and if they be not destroyed by the harrows, the land must be hoed. Indeed, the goodness of the crop depends so much upon preventing the weeds from coming to any height, that it is necessary to hoe potatoes frequently. If the rows be wide, a kind of breast-hoe may be used to throw the earth a little on each side, by which it will be raised about the plants.

When the husk that contains the feed, or the apple, as it is commonly called, is completely formed, the stalks may be cut down and given to cows. Milk-cows have

been tried with this food; they eat it very freely, and it gives no bad flavour to the milk.

The time of taking up potatoes is commonly regulated by the market. But, if nothing be in view but the largeness of the crop, they ought to stand till October, or as long as they can be conveniently taken up before the frost sets in. The most expeditious method of taking them up is by the plough: Eight or nine persons to attend the plough are sufficient. After the field is once ploughed, it ought to be harrowed, by which some of the potatoes will be raised; and when these are gathered, it should be ploughed a second time.

3. AGRICULTURE

Of the Food of Plants.

It is thought to be an important question in agriculture, whether the several kinds of plants require the same, or different nourishment.

Upon a superficial view of this question, it would appear very improbable, that the same matter could nourish such a variety of plants, differing so essentially in smell, taste, figure, &c. Much, however, may depend upon the internal structure and arrangement of the vessels. One thing is certain, that if the vessels in any plant be uncommonly small, parts will be rejected by that plant which would be absorbed by one whose vessels are larger.

It is given out as a fact, by writers on this subject, that one plant will starve another, by robbing it of nourishment. This does not seem to affect either side of the question; for it may starve its neighbour, either by extending its roots, and requiring a greater quantity of nourishment than the other; or it may absorb the peculiar food which is necessary for the growth of the other plant. In either case, the plant is deprived of a proper quantity of nourishment.

It is likewise proposed as a difficulty, Why a poisonous plant and its antidote will grow in the same soil, and very near each other. This argument is of the same nature with the former. It may be owing either to these plants imbibing different juices from the earth, or to peculiarities in the structure and action of their vessels. These, and many other ambiguous facts, have been advanced on both sides of this question, which we shall not spend time in encouraging.

The argument drawn from grafted plants, seems more direct and decisive. A stalk of a lemon, grafted on a branch of an orange-tree, grew, ripened its fruit, and preserve the figure and all the other qualities belonging to a lemon. This plainly indicates, that the organization of the lemon had given a different modification to the juices of the orange, through the intervention of which it received its nourishment.

It is also certain, that the different parts of the same plants have frequently various smells, tastes, &c. although the nourishment derived from the root must be the same. This is an evidence, that the different structure of parts in the same plants is capable of producing very sensible changes in the nature and quality of the sap.

Repeated experiments show, that many plants of very opposite qualities, and even trees, have been nourished and brought to maturity by the purest water alone.

It is observed, on the other hand, that different plants require different soils. This is certainly true. But what then? Does not this difference in soil rather depend upon the greater or lesser quantity, than any peculiar quality in the food? Thyme grows best in a dry soil; but it will grow equally well in earth carried from a marsh to the top of a mountain.

The roots of plants are fitted to absorb every fluid that comes within their reach. They have been found by experiment to imbibe fluids that actually poison them. From this circumstance it may be fairly concluded, that they have not, like animals, the sagacity of chusing the food that is most proper for nourishing them, and rejecting that which is either noxious or less nourishing.

Mr Dickson, author of an excellent treatise on agriculture, published in 1765, has endeavoured to fix the particular ingredients that enter into the composition of the

food of vegetables. He contends, that neither earth, water, air, oil, nor salt, can be called the food of plants; but he thinks that it consists of a combination of these substances. His arguments in support of this theory are chiefly drawn from the chemical analysis, which shows, that all these substances may be extorted from vegetables by the force of fire; and from a consideration that a due admixture of these substances (or such things as contain them) is favorable, and even necessary, to vegetation.

His last argument is good: But whoever attempts to discover the properties of plants, or the ingredients of their food, from a chemical analysis, will probably never do much service to the science of agriculture. Fire and a retort is capable of torturing either animals or vegetables into forms and qualities which never existed either in these bodies, or in their food. The farmer, in nourishing his plants, should be directed entirely by experience. If he knows, that putrid animal and vegetable substances, that lime, soot, marle, &c. when applied with judgment, assist the growth of his plants, and augment his crop, it is of little consequence whether he be acquainted with their chemical analysis, or the particular mode of their operation.

4. ALGEBRA is a general method of computation by certain signs and symbols, which have been contrived for this purpose, and found convenient. It is called an Universal Arithmetic, and proceeds by operations and rules similar to those in common arithmetic, founded upon the same principles. But as a number of symbols are admitted into this science, being necessary for giving it that extent and generality which is its greatest excellence, the import of those symbols must be clearly stated.

In geometry, lines are represented by a line, triangles by a triangle, and other figures by a figure of the same kind: But, in algebra, quantities are represented by the same letters of the alphabet; and various signs have been imagined for representing their affections, relations, and dependencies.

The relation of equality is expressed by the sign $=$; thus, to express that the quantity represented by a is equal to that which is represented by b , we write $a = b$. But if we would express that a is greater than b , we write $a > b$; and if we would express algebraically that a is less than b , we write $a < b$.

Quantity is that which is made up of parts, or is capable of being greater or less. It is increased by addition, and diminished by subtraction; which are therefore the two primary operations that relate to quantity. Hence it is, that any quantity may be supposed to enter into algebraic computations two different ways, which have contrary effects; either as an increment, or as a decrement; that is, as a quantity to be added, or as a quantity to be subtracted. The sign $+$ (plus) is the mark of addition, and the sign $-$ (minus) of subtraction. As addition and subtraction are opposite, or an increment is opposite to a decrement, there is an analogous opposition between the affections of quantities that are considered in the mathematical sciences; as, between

excess and defect; between the value of effects or money due to a man, and money due by him. When two quantities, equal in respect of magnitude, but of those opposite kinds, are joined together, and conceived to take place in the same subject, they destroy each other's effect, and their amount is *nothing*. Thus, 100 *l.* due to a man and 100 *l.* due by him balance each other, and in estimating his stock may be both neglected. When two unequal quantities of those opposite qualities are joined in the same subject, the greater prevails by their difference. And, when a greater quantity is taken from a lesser of the same kind, the remainder becomes of the opposite kind.

A quantity that is to be added is likewise called a positive quantity; and a quantity to be subtracted is said to be negative: They are equally real, but opposite to each other, so as to take away each other's effect, in any operation, when they are equal as to quantity. Thus, $3 - 3 = 0$, and $a - a = 0$. But though $+a$ and $-a$ are equal as to quantity, we do not suppose in algebra that $+a = -a$; because, to infer equality in this science, they must not only be equal as to quantity, but of the same quality, that in every operation the one may have the same effect as the other. A decrement may be equal to an increment, but it has in all operations a contrary effect; a motion downwards may be equal to a motion upwards; and the depression of a star below the horizon may be equal to the elevation of a star above it: But those positions are opposite, and the distance of the stars is greater than if one of them was at the horizon, so as to have no elevation above it, or depression below it. It is on account of this contrariety, that a negative quantity is said to be less than nothing, because it is opposite to the positive, and diminishes it when joined to it; whereas the addition of 0

has no effect. But a negative is to be considered no less as a real quantity than the positive. Quantities that have no sign prefixed to them are understood to be positive.

The number prefixed to a letter is called the numeral coefficient, and shews how often the quantity represented by the letter is to be taken. Thus $2a$ imports that the quantity represented by a is to be taken twice, $3a$ that it is to be taken thrice; and so on. When no number is prefixed, unit is understood to be the coefficient. Thus 1 is the coefficient of a or b .

5. ANABAPTISTS, a sect or denomination of Christians, who deduce their original from the apostolic age. This name was given them by their opponents, soon after the Reformation, by way of scorn, and imports *rebaptizing*; but this charge they disclaim, by denying that the sprinkling, or pouring of water, upon infants, has any relation at all to the scripture-ordinance of baptism, either as to its subjects or mode.

Though they believe the salvation of elect infants; yet they deny their being the proper subjects of baptism: Because they can find neither precept nor example for such a practice in the N. Testament: Because Christ's commission to baptize appears to them to restrict this ordinance to such only as are taught, or made disciples, and believe the gospel: Because the apostles, in executing Christ's commission, never baptized any but those who were first instructed in the Christian faith, and professed their belief of it: And because the nature and design of the ordinance is such as can be of no advantage to infants, it being a sign and representation of spiritual blessings, intended to impress the mind of the person baptized with a comfortable sense of what is signified thereby; and as infants can neither discern the sign nor the thing signified, so they think they can reap no benefit from it, any more than from the Lord's supper, or any other ordinance of the gospel.

They repel the argument drawn from circumcision, by distinguishing betwixt the Old and New Testament dispensations, and betwixt the natural and spiritual seed of Abraham, and maintain, that as circumcision belonged to the carnal birth, so baptism belongs only to the spiritual birth, or those who are of faith. Our Lord's words in Mark x., 13, 14, they consider as having no relation to infant-baptism, as he there neither enjoins nor exemplifies it; and they distinguish between those who may

be subjects of the kingdom of heaven in God's sight, and those whom he points out to us as proper visible subjects of gospel ordinances. The argument from the apostles their baptizing whole houses, they answer, by shewing that these houses heard the word, believed, were comforted, and abounded in good works, and so could not be infants.

The mode or manner of baptism they affirm to be dipping or immersing the whole body in water. This they say is the primary and proper meaning of the original word *Babtizo*, to dip, immerse, or plunge. Hence they affirm, that no other mode can be called baptism, or to fitly represent communion with Christ in his death, burial, and resurrection, which is expressly the design of baptism.

Great troubles were occasioned in Germany by some who professed this tenet; but of all places where they prevailed, none suffered so much by them as the town of Munster. The Anabaptists, however, of Holland and Frizland disapproved of their seditious behavior: and at present, though this sect still subsists, as well in Britain as abroad, they no longer oppose magistrates, nor preach up a community of goods. Those of them in England differ very little from the Protestant dissenters, except in rejecting infant-baptism; as appears from their confession of faith published 1689.

Within these four years, the Anabaptists have formed a congregation in Edinburgh (which is the first appearance they ever made in Scotland), and seem to be a serious inoffensive people. They pray for the king and all inferior magistrates, and subject themselves (in civil matters) to every ordinance of man, for the Lord's sake. They consider the kingdom of Christ to be spiritual, and not of this world: And are strictly upon the congregational or independent plan, admitting of no jurisdiction or

authority (in matters of religion) but that of the Great Lawgiver. Their church-officers are bishops (or elders) and deacons, and these they generally chuse from among themselves. They make the reading of the Scriptures a part of their public service, and eat the Lord's supper every Sabbath-day. Their disciples, before they are admitted into communion, are first baptized in the Water of Leith, which they do at all seasons of the year: and, on these occasions, they are generally attended by a great number of spectators.

As we chuse to avoid every kind of misrepresentation, especially in matters of religious opinion, and as the most genuine and satisfactory account of the origin and principles of any sect is to be expected from themselves, we applied to the preachers of the Anabaptist congregation in Edinburgh, from whom we had the above account.—The same conduct will be observed with regard to every other sect of any note.

6. ASTRONOMY

Astronomy is the science which treats of the nature and properties of the heavenly bodies.

Of ASTRONOMY in general.

By astronomy we discover that the earth is at so great a distance from the sun, that if seen from thence it would appear no bigger than a point, although its circumference is known to be 25, 020 miles. Yet that distance is so small, compared with the earth's distance from the fixed stars, that if the orbit in which the earth moves round the sun were solid, and seen from the nearest star, it would likewise appear no bigger than a point, although it is at least 162 millions of miles in diameter. For the earth, in going round the sun, is 162 millions of miles nearer to some of the stars at one time of the year than at another; and yet their apparent magnitudes, situations, and distances from one another still remain the same; and a telescope which magnifies above 200 times does not sensibly magnify them; which proves them to be at least 400 thousand times farther from us than we are from them.

It is not to be imagined that all the stars are placed in one concave surface, so as to be equally distant from us; but that they are scattered at immense distances from one another through unlimited space. So that there may be as great a difference between any two neighbouring stars, as between our sun and those which are nearest to him. Therefore an observer, who is nearest any fixed star, will look upon it alone as a real sun; and consider the rest as so many shining points, placed at equal distances from him in the firmament.

By the help of telescopes we discover thousands of stars which are invisible to the naked eye; and the better our glasses are, still the more become visible; so that no limits can be set either to their number or their distances.

The sun appears very bright and large in comparison of the fixed stars, because we keep constantly near the sun, in comparison of our immense distance from the stars. For a spectator, placed as near to any star we are to the sun, would see that star a body as large and bright as the sun appears to us; and a spectator, as far distant from the sun as we are from the stars, would see the sun as small as we see a star, divested of all its circumvolving planets; and would reckon it one of the stars in numbring them.

The stars, being at such immense distances from the sun, cannot possibly receive from him so strong a light as they seem to have: nor any brightness sufficient to make them visible to us. For the sun's rays must be so scattered and dissipated before they reach such remote objects, that they can never be transmitted back to our eyes, so as to render their objects visible by reflexion. The stars therefore shine with their own native and unborrowed lustre, as the sun does; and since each particular star, as well as the sun, is confined to a particular portion of space, it is plain that the stars are of the same nature with the sun.

Instead then of one sun and one world only in the universe, astronomy discovers to us such an inconceivable number of suns, systems, and worlds, dispersed through boundless space, that if our sun, with all the planets, moons, and comets belonging to it, were annihilated, they would be no more missed, by an eye that could take in the whole creation, than a grain of sand from the sea-shore: The space they

possess being comparatively so small, that it would scarce be a sensible blank in the universe, although Saturn, the outermost of our planets, revolves about the sun in an orbit of 4884 millions of miles in circumference, and some of our comets make excursions upwards of ten thousand millions of miles beyond Saturn's orbit; and yet, at that amazing distance, they are incomparably nearer to the sun than to any of the stars; as is evident from their keeping clear of the attractive power of all the stars, and returning periodically by virtue of the sun's attraction.

From what we know of our own system, it may be reasonably concluded that all the rest are with equal wisdom contrived, situated, and provided with accommodations for rational inhabitants. For although there is almost an infinite variety in the parts of the creation which we have opportunities of examining, yet there is a general analogy running through, and connecting all the parts into one great and universal system.

7. BEAUTY, in its native signification, is appropriated to objects of sight. Objects of the other senses may be agreeable, such as the sounds of musical instruments, the smoothness and softness of some surfaces; but the agreeableness called beauty belongs to objects of sight.

Objects of sight are more complex than those of any other sense: In the simplest, we perceive colour, figure, length, breadth, thickness. A tree is composed of a trunk, branches, and leaves; it has colour, figure, size, and sometimes motion: By means of each of these particulars, separately considered, it appears beautiful; but a complex perception of the whole greatly augments the beauty of the object. The human body is a composition of numberless beauties arising from the parts and qualities of the object, various colours, various motions, figures, size, &c. all united in one complex object, and striking the eye with combined force. Hence it is, that beauty, a quality so remarkable in visible objects, lends its name to every thing that is minimally agreeable. Thus, by a figure of speech, we say, a beautiful sound, a beautiful thought, a beautiful discovery, &c.

Considering attentively the beauty of visible objects, two kinds are discovered. The first may be termed intrinsic beauty, because it is discovered in a single object, without relation to any other; the other may be termed relative, being founded on the relation of objects. Intrinsic beauty is a perception of sense merely; for to perceive the beauty of a spreading oak, or of a flowing river, no more is required but singly an act of vision. Relative beauty is accompanied with an act of understanding and reflection; for we perceive not the relative beauty of a fine instrument or engine, until we learn its use and destination. In a word, intrinsic

beauty is ultimate; and relative beauty is that of means relating to some good end or purpose. These different beauties agree in one capital circumstance, that both are equally perceived as belonging to the object; which will be readily admitted with respect to intrinsic beauty, but is not so obvious with respect to the other. The utility of the plough, for example, may make an object of admiration or of desire; but why should utility make it beautiful? A natural propensity of the human mind will explain this difficulty: By an easy transition of ideas, the beauty of the effect is transferred to the cause, and is perceived as one of the qualities of the cause: Thus a subject void of intrinsic beauty, appears beautiful by its utility; a dwelling-house void of all regularity, is however beautiful in the view of convenience; and the want of symmetry in a tree, will not prevent its appearing beautiful, if it be known to produce good fruit.

When these two beauties concur in any object, it appears delightful. Every member of the human body possesses both in a high degree.

The beauty of utility, being accurately proportioned to the degree of utility, requires no illustration: But intrinsic beauty being more complex, cannot be handled distinctly without being analysed. If a tree be beautiful by means of its colour, figure, motion, size, &c. it is in reality possessed of so many different beauties. The beauty of colour is too familiar to need explanation. The beauty of figure is more; for example, viewing any body as a whole, the beauty of its figure arises from regularity and simplicity; viewing the parts with relation to each other, uniformity, proportion, and order, contribute to its beauty.

We shall make here a few observations on simplicity, which may be of use in examining the beauty of single objects. A multitude of objects crowding into the mind at once, disturb the attention, and pass without making any lasting impression: In the same manner, even a single object, consisting of a multiplicity of parts, equals not, in strength of impression, a more simple object comprehended in one view.

In all the works of nature, simplicity makes a capital figure. It also makes a figure in works of art: Profuse ornament in painting, gardening, or architecture, as well as in dress or in language, shows a mean or corrupted taste. Simplicity in behavior and manners has an enchanting effect, and never fails to gain our affection. Very different are the artificial manners of modern times. A gradual progress from simplicity to complex forms and profuse ornament, seems to be the fate of all the fine arts; resembling behaviour, which from original candour and simplicity, has degenerated into duplicity of heart and artificial refinements. At present literary productions are crowded with words, epithets, figures: In music, sentiment is neglected for the luxury of harmony, and for difficult movement.

8. BRIDGE, a work of masonry or timber, consisting of one or more arches, built over a river, canal, or the like, for the convenience of crossing the same.

Bridges are a sort of edifices very difficult to execute, on account of the inconvenience of laying foundations, and walling under water. The parts of a bridge are the piers, the arches; the pavement, or way over for cattle and carriages; the foot-way on each side, for foot passengers; the rail or parapet, which incloses the whole; and the butments or ends of the bridge on the bank.

The conditions required in a bridge are, that it be well-designed, commodious, durable, and suitably decorated. The piers of stone-bridges should be equal in number, that there may be one arch in the middle, where commonly the current is strongest; their thickness is not to be less than a sixth part of the span of the arch, nor more than a fourth; they are commonly guarded in the front with angular sterlings, to break the force of the current: the strongest arches are those whose sweep is a whole semicircle; as the piers of bridges always diminish the bed of a river, in case of inundations, the bed must be sunk or hollowed in proportion to the space taken up by the piers (as the waters gain in depth what they lose in breadth) which otherwise conduce to wash away the foundation and endanger the piers: To prevent this, they sometimes diminish the current, either by lengthening its course, or by making it more winding; or by stopping the bottom with rows of planks, stakes, or piles, which break the current. It is also required that the foundation of bridges be laid at that season of the year, when the waters are lowest; and if the ground be rocky, hard gravel, or stony, the first stones of the foundation may be laid on the surface; but if the soil be soft sand, it will be necessary to dig till you come to a firm bottom.

Among the bridges of antiquity, that built by Trajan over the Danube is allowed to be the most magnificent; it was composed of twenty arches, of an hundred and fifty feet in height, and their opening from one pier to another was an hundred and forty feet: The piers of this fine bridge are still to be seen in the Danube, being erected between Servia and Moldavia, a little above Nicopolis.

Among modern bridges, that of Westminster, built over the river Thames, may be accounted one of the finest in the world: It is forty-four feet wide, a commodious foot-way being allowed for passengers, on each side, of about seven feet broad, raised above the road allowed for carriages, and paved with broad moor-stones, while the space between them is sufficient to admit three carriages and two horses to go abreast, without any danger. The free water-way under the arches of this bridge is eight hundred and seventy feet, being four times as much as the free water-way left between the sterlings of London-bridge. This disposition, together with the gentleness of the stream, are the chief reasons why no sensible fall of water can ever stop, or in the least endanger the smallest boats in their passage through the arches.

It consists of thirteen large and two small arches, together with fourteen intermediate piers.

This bridge is built of the best materials; and the size and disposition of these materials are such, that there is no false bearing, or so much as a false joint in the whole structure; besides that, it is built in a neat and elegant taste, and with such simplicity and grandeur that, whether viewed from the water, or by the passengers who walk over it, it fills the mind with an agreeable surprise. The semioctangular towers, which form the recesses of the foot-way, the manner of placing the lamps,

and the height of the balustrade, are at once the most beautiful, and, in every other respect, the best contrived.

But the most singular bridge in Europe is that built over the river Tave in Glamorganshire. It consists of one stupendous arch, the diameter of which is 175 feet. This magnificent arch was built by William Edward, a poor country-mason, in the year 1756.

Bridges are either built of stone or timber, as is judged most convenient.

9. CHEMISTRY, *The ANALYSIS of MINERAL SUBSTANCES.*

MINERALS differ greatly from vegetables, and from animals; they are not near so complex as those organized bodies, and their principles are much more simple; whence it follows, that these principles are much more closely connected, and that they cannot be separated without the help of fire; which not having on their parts the same action and the same power as on organized bodies, hath not the same ill effect on them; we mean the effect of changing their principles, or even destroying them entirely.

We do not here speak of pure, vitrifiable, or refractory earths; of mere metals and semi-metals; of pure acids; or even of their simplest combinations, such as sulphur, vitriol, alum, sea-salt: Of all these we have said enough.

We are now to treat of bodies that are more complex, and therefore more susceptible of decomposition. These bodies are compound masses or combinations of those above-mentioned; that is, metallic substances as they are found in the bowels of the earth, united with several sorts of sand, stones, earths, semi-metals, sulphur, &c. When the metallic matter is combined with other matters in such a proportion to the rest that it may be separated from them with advantage and profit, these compounds are called *ores*: when the case is otherwise, they are called *pyrites*, and *marcasites*; especially if sulphur or arsenic be predominant therein, which often happens.

In order to analyse an ore, and get out of it the metal it contains, the first step is to free it from a great deal of earth and stones which commonly adhere to it very slightly and superficially. This is effected by pounding the ore, and then washing it in

water; to the bottom of which the metalline parts presently sink, as being the heaviest, while the small particles of earth and stone remain suspended some time longer.

Thus the metallic part is left combined with such matters only as are most intimately complicated with it. These substances are most commonly sulphur and arsenic. Now, as they are much more volatile than other mineral matters, they may be dissipated in vapours, or the sulphur may be consumed, by exposing the ore which contains them to a proper degree of heat. If the sulphur and arsenic be desired by themselves, the fumes thereof may be caught and collected in proper vessels and places. This operation is called *roasting* in ore.

The metal thus depurated is now fit to be exposed to a greater force of fire, capable of melting it.

On this occasion the semi-metals and the imperfect metals require the addition of some matter abounding in phlogiston, particularly charcoal-dust; because these metallic substances lose their phlogiston by the action of the fire, or of the fluxes joined with them, and therefore without this precaution would never acquire either the splendor or the ductility of a metal. By this means the metallic substance is more accurately separated from the earthy and stony parts, of which some portion always remains combined therewith until it is brought to fusion. For, as we observed before, a metallic glass or calx only will contract an union with such matters; a metal possessed of its phlogiston and metalline form being utterly incapable thereof.

The metal therefore on this occasion gathers into a mass, and lies at the bottom of the vessel, as being most ponderous; while the heterogeneous matters float upon it in the form of a glass, or a semi-vitrification. These floating matters take the

name of *scoriae*, and the metalline substance at bottom is called the *regulus*. It frequently happens, that the metalline regulus thus precipitated is itself a compound of several metals mixed together, which are afterwards to be separated.

It is proper to observe, before we quit this subject, that the rules here laid down for analyzing ores are not absolutely general: For example, it is often advisable to roast the ore before you wash it; for by that means some ores are opened, attenuated, and made very friable, which would cost much trouble and expence, on account of their excessive hardness, if you should attempt to pound them without a previous torrefaction. It is also frequently necessary to separate the ore from part only of its stone; sometimes to leave the whole; and sometimes to add more to it, before you smelt it. This depends on the quality of the stone, which always helps to promote fusion when it is in its own nature fusible and vitrifiable.

10. FIRE, a general name, by which men seem to understand a certain sensation or complex notion of light, heat, burning, melting, &c.

The power of fire is so great, its effects so extensive, and the manner of its acting so wonderful, that some of the wisest nations of old revered and worshipped it, as the supreme deity. Some of the chemists also, after they had discovered its surprising operations, suspected it to be an uncreated being: and indeed the most famous of them have acknowledged it as the source of all their knowledge; and hence have professed themselves philosophers by fire, nor thought they could be honoured with a nobler title. Now, amongst all the wonderful properties of fire, there is none more extraordinary than this, that though it is the principal cause of almost all the sensible effects that continually fall under our observations, yet it is itself of so infinitely a subtile nature, that it illudes the most sagacious inquiries, nor ever comes within the cognizance of our senses. Fire is generally divided into three kinds or species, *viz.* celestial, subterraneous, and culinary.

By celestial fire is principally understood that of the sun, without regard to that of the fixed stars, though this perhaps may be of the same nature. By subterraneous fire we understand that which manifests itself in fiery eruptions of the earth, volcanoes, or burning mountains; or by any other effects it produces in mines, or the more central parts of the earth. By culinary fire we mean that employed in all chemical operations, and the common occasions of life.

The sun's heat appears to be the actuating principle, or general instrument of all the operations in the animal, vegetable, atmospherical, and mineral kingdoms. Fire, considered in itself, seems to exist in the greatest purity and perfection in the

celestial regions; at least we are insensible of any considerable smoke it yields: for the rays of light come to us from the sun, unmixed with any of that gross, feculent, or terrestrial matter, found in culinary and subterranean fires: but, allowing for this difference, the effects of the solar fire appear the same as those of culinary fire.

If we to examine the effects of subterraneous fires, we shall find them the same with those produced by culinary fire. Thus, burnt coals, cinders, and melted minerals, are thrown up by Vesuvius and other burning mountains. Warm nephritical exhalations, natural hot springs, steams, vapours, smoke, &c. are found in several parts of the globe, rising nearly in the same manner as if they were produced by the heat of a furnace. Whence it appears, that subterraneous fires are of the same nature with the culinary.

As men generally affix to the word fire, a complex idea of burning, light, heat, melting, &c. this idea should be analysed, in order to see what parts are essential, and what precarious or arbitrary. We frequently find the effects of fire produced where no visible fire appeared. Thus the fingers are easily burnt by an iron heated below the degree of ignition, or so as to be in no ways visibly red-hot or fiery: whence it follows, that the eye is no judge of fire.

Again, the effects of fire are often produced without any manifest signs of burning, melting, &c. as in evaporations, &c. If this method of exclusion and rejection were pursued to its due length, we should perhaps find no criterion, infallible mark, or characteristic of fire in general, but that of a particular motion struggling among the minute parts of bodies, and tending to throw them off at the surface. If this should prove the case, then such a motion will be the form and effect

of fire; and which, being present, makes fire also present: and when absent, makes fire also absent: whence to produce fire, and produce this motion in bodies, will be one and the same thing.

The great and fundamental difference in respect to the nature of fire is, whether it be originally such, formed thus by the Creator himself at the beginning of things; or whether it be mechanically producible from other bodies, by inducing some alterations in the particles thereof. Bacon deduces, from a great number of particulars, that heat in bodies is no other than motion so and so circumstanced; so that to produce heat in a body, nothing is required but to excite a certain motion in the parts thereof. Boyle seconds him in an express treatise of the mechanical origins of heat and cold, and maintains the same doctrine with new observations and experiments.

11. FROST, in physiology, such an excessively cold state of the air as converts watery fluids into ice.

In very cold snowy weather, not only water, but urine, beer, ale, milk, vinegar, and even wine, are either wholly or in part converted into ice, though the last but slowly. As to the freezing of expressed oils, a very intense cold may deprive them of their fluidity, so as to be capable of being cut into portions of any figure; but whether they are convertible into real ice, is not yet determined. In Russia oil freezes much harder than with us, but does not even there become perfect ice. Common aniseed-water, and the like weak spirits, are said to be converted into an imperfect ice in Muscovy; and the strong spirits into a substance like that of oil. When brandy freezes, a liquid part, much stronger than common brandy, retires to the centre of the vessel.

Even solid bodies are liable to be affected by frost: timber is often apparently frozen, and rendered excessively difficult to saw. Marble, chalk, and other less solid terrestrial concretions, will be shattered by strong and durable frosts. Metals are contracted by frost: thus, an iron tube, twelve feet long, upon being exposed to the air in a frosty night, lost two lines of its length. On the contrary, it swells or dilates fluids near one tenth of their bulk. Trees are frequently burnt up with frost, as with the most excessive heat: and in very strong frosts, walnut-trees, and even oaks, are sometimes miserably split and cleft, so as to be seen through, and this with a terrible noise, like the explosion of fire arms.

Frost naturally proceeds from the upper part of bodies downwards; but how deep it will reach in earth or water, is not easily known, because this depth may vary

with the degree of coldness in the air, by a longer or shorter duration of the frost, the texture of the earth, the nature of the juices wherewith it is impregnated, the constitution of its more internal parts as to heat and cold, the nature of its effluvia, &c. Mr Boyle, in order to ascertain that depth, after four nights of hard frost, dug in an orchard, where the ground was level and bare, and found the frost had scarce reached three inches and a half; and in a garden nearer the house, only two inches below the surface. Nine or ten successive frosty nights froze the bare ground in the garden six inches and a half deep; and in the orchard, where a wall sheltered it from the south sun, to the depth of eight inches and a half. He also dug in an orchard, near a wall, about a week afterwards, and found the frost to have penetrated to the depth of fourteen inches. In a garden at Moscow, the frost in a hard season only penetrates to two feet: and the utmost effect that capt. James mentioned the cold to have had upon the ground of Charlton island, was to freeze it to ten feet deep: whence may appear the different degrees of cold of that island and Russia. And as to the freezing of water at the above-mentioned island, the captain tells us, it does not naturally congeal above the depth of six feet, the rest being by accident. Water also, exposed to the cold air in large vessels, always freezes first at the upper surface, the ice gradually increasing and thickening downwards; for which reason frogs retire in frosty weather to the bottom of ditches; and it is said, that shoals of fish retire in winter to those depths of the sea and rivers, where they are not to be found in summer. Water, like the earth, seems not disposed to receive any very intense degree of cold at a considerable depth or distance from the air. The vast masses of ice formed in the northern seas being

only many flakes and fragments, which, sliding under each other, are, by the congelation of the intercepted water, cemented together.

In cold countries, the frost proves often fatal to mankind; not only producing cancers, but even death itself. Those who die of it have their hands and feet first seized till they grow past feeling it; after which the rest of their bodies is so invaded, that they are taken with a drowsiness, which if indulged, they awake no more, but die insensibly. But there is another way whereby it proves mortal, *viz.* by freezing the abdomen and viscera, which on dissection are found to be mortified and black.

12. GARDENING, a branch of agriculture, containing the cultivation of gardens.

The simplest idea of a garden, is that of a spot embellished with a number of natural objects, trees, walks, polished parterres, flowers, streams, &c. One more complex comprehends statues and buildings, that nature and art may be mutually ornamental. A third approaching nearer perfection, is of objects assembled together, in order to produce, not only an emotion of beauty, essential to every garden, but also some other particular emotion, grandeur for example, or gaiety. The most perfect idea of a garden is an improvement upon the third, requiring the several parts to be arranged in such a manner, as to inspire all the different emotions that can be raised by gardening. In this idea of a garden, the arrangement is an important circumstance; for some emotions figure best in conjunction, and others ought always to appear in succession and never in conjunction. When the most opposite emotions, such as gloominess and gaiety, stillness and activity, follow each other in succession, the pleasure on the whole will be the greatest; but such emotions ought not to be united, because they produce an unpleasant mixture. For that reason, a ruin, affording a sort of melancholy pleasure, ought not to be seen from a flower-parterre, which is gay and cheerful: but to pass from an exhilarating object to a ruin, has a fine effect; for each of the emotions is the more sensibly felt by being contrasted with the other. Similar emotions, on the other hand, such as gaiety and sweetness, stillness and gloominess, motion and grandeur, ought to be raised together; for their effects upon the mind are greatly heightened by their conjunction.

One garden must be distinguished from a plurality; and yet it is not obvious wherein the unity of a garden consists. A notion of unity is indeed suggested from

viewing a garden surrounding a palace, with views from each window, and walks leading to every corner: but there may be a garden without a house; in which case, what makes it one garden, is the unity of design, every single spot appearing part of a whole. The gardens of Versailles, properly expressed in the plural number, being no fewer than sixteen, are indeed all of them connected with the palace, but have scarce any mutual connection: they appear not like the parts of one whole, but rather like small gardens in contiguity.

Regularity is required in that part of a garden which joins the dwelling-house; for being considered as a more immediate accessory, it ought to partake the regularity of the principal object: but in proportion to the distance from the house considered as the centre, regularity ought less and less to be studied; for, in an extensive plan, it hath a fine effect to lead the mind insensibly from regularity to a bold variety. Such arrangement tends to make an impression of grandeur: and grandeur ought to be studied as much as possible, even in a more confined plan, by avoiding a multiplicity of small parts. A small garden, on the other hand, which admits not grandeur, ought to be strictly regular.

An hill, by being covered with trees, appears both more powerful and more lofty; provided no other beauties be hid that might be seen if the hill were naked. To distribute trees in a plain requires more art: near the dwelling-house they ought to be so thin, as not to break the unity of the field; and even at the greatest distance of distinct vision, they ought never to be so crowded as to hide any beautiful object.

By a judicious distribution of trees, various beauties may be produced. A landscape so rich as to engross the whole attention, and so limited as sweetly to be

comprehended under a single view, has a much finer effect than the most extensive landscape that requires a wandering of the eye through successive scenes. This consideration suggests a capital rule in laying out a field; which is, never at any one station to admit a larger prospect than can easily be taken in at once. A field so happily situated as to command a great extent of prospect, is a delightful subject for applying this rule; let the prospect be split into proper parts by means of trees; studying at the same time to introduce all the variety possible. A plan of this kind executed with taste will produce charming effects: the beautiful prospects are multiplied: each of them is much more agreeable than the entire prospect was originally: and, to crown the whole, the scenery is greatly diversified.

13. GRAMMAR, Of UNIVERSAL GRAMMAR

It is not necessary here to inquire how language was originally invented, to trace the various changes it may have undergone, or to examine whether any one language may be considered as the original from which all others have been derived; it is sufficient for our purpose to observe, that all mankind, however diversified in other respects, agree in the common use of language; from which it appears, that language is not merely accidental and arbitrary, but founded in the nature of things, and within the reach of all mankind. It is therefore an object worthy of a philosophic inquiry to discover the foundations upon which this universal fabric has been raised.

The design of speech is to publish to others the thoughts and perceptions of our mind. The most acute feelings of man, as well as of every other animal, are expressed by simple inarticulate sounds, which, as they tend to the preservation of the individual, are universally understood. These inarticulate but significant sounds, therefore, constitute a natural and universal language, which man, as a mere sensitive being, partakes in common with the other animals. But as man is not only endowed with sensation, but with the faculty of reasoning, simple inarticulate sounds are insufficient for expressing all the various modifications of thought, or for communicating to others a chain of argumentation: it was therefore necessary to call in the aid of *articulation*; which by modifying these simple sounds, and by fixing a particular meaning to these modifications, forms the language peculiar to man, and which distinguishes him from all other animals, and enables him to communicate with facility all that diversity of ideas with which his mind is stored. These sounds, thus modified and having a determinate meaning, are called words, and as all

language is composed of significant sounds variously combined, a knowledge of them is necessary previous to our acquiring an adequate idea of language.

But, as it is by words that we express the various ideas which occur to the mind, it is necessary to examine how ideas themselves are suggested, before we can ascertain the various classes into which words may be distributed. With this view, therefore, let us suppose a reasonable being, devoid of every prepossession whatever, placed upon this globe. His attention would, in the first place, be directed to the various objects which he saw existing around him: these he would naturally endeavour to distinguish from one another, and give them names, by means of which the idea of them might be recalled when the objects themselves were absent. This is one copious source of words, and forms a natural class which must be common to every language; and which is distinguished by the name of nouns. And as these nouns are the names of the several substances which exist, they have likewise been called substantives.

It would likewise be early discovered, that every one of these substances were endowed with certain qualities or attributes, to express which another class of words would be requisite. Thus, to be weighty, is a quality of matter; to think, is an attribute of man. Therefore, in every language, words have been invented to express the various qualities of the several objects which exist. These may all be comprehended under the general denomination of attributives.

These two classes of words must comprehend all things that exist; for whatever exists, must of necessity be either a substance, or the attribute of some substance; and hence these two classes must comprehend all those words which are

significant of themselves, and may be called words significant of themselves. If any other words occur, they can only be significant insofar as they tend to explain or connect the words of the two former classes.

But, although these words form the basis or matter of a language, in the same manner as stones form the matter of a building; yet, as stones cannot be arranged into a regular structure without a cement to bind and connect them, so these original words stand in need of others to connect them, before they can be made to express all the variety of our ideas. Another order of words, therefore, were necessary, which, although not of themselves significant, yet, when joined with others, might acquire a meaning. These form a second general class of words that may be called words not of themselves significant, and which cannot acquire any meaning but so far as they serve either to explain or connect the others.

14. HATCHING, the maturing fecundated eggs, whether by the incubation and warmth of the parent-bird, or by artificial heat, so as to produce young chickens alive.

The art of hatching chickens by means of ovens has long been practiced in Egypt; but it is there only known to the inhabitants of a single village named Berme, and to those that live at a small distance from it. Towards the beginning of autumn they scatter themselves all over the country, where each person among them is ready to undertake the management of an oven, each of which is of a different size, but in general they are capable of containing from forty to fourscore thousand eggs. Every Bermean is under the obligation of delivering to the person who intrusts him with an oven, only two thirds of as many chickens as there have been eggs put under his care; and he is a gainer by this bargain, as more than two thirds of the eggs usually produce chickens.

This useful and advantageous method of hatching eggs has been lately discovered in France, by the ingenious Mr Reaumur, who, by a number of experiments, has reduced the art to certain principles. He found by experience that the heat necessary for this purpose is nearly the same as that marked 32 on his thermometer, or that marked 96 on Faraday's. This degree of heat is nearly that of the skin of the hen, and, what is remarkable, of the skin of all other domestic fowls, and probably of all other kinds of birds. After many experiments, Mr Reaumur found that stoves heated by means of a baker's oven, succeeded better than those made hot by layers of dung; and the furnaces of glass houses, and those of the melters of metals, by means of pipes, to convey heat into a room, might, no doubt, be made to answer the same purpose. As to the form of the stoves, no great nicety is required; a

chamber over an oven will do very well; nothing more will be necessary but to ascertain the degree of heat, which may be done by melting a lump of butter, of the size of a walnut, with half as much tallow, and putting it into a phial; this will serve to indicate the heat with sufficient exactness, for when it is too great, this mixture will become as liquid as oil, and when the heat is too small, it will remain fixed in a lump; but it will flow like a thick syrup, upon inclining the bottle, if the stove be of a right temper; great attention therefore should be given to keep the heat always at this degree, by letting in fresh air, if it be too great, or shutting the stove more close, if it be too small; and that all the eggs in the stove may equally share the irregularities of the heat, it will be necessary to shift them from the sides to the centre; thereby imitating the hens, who are frequently seen to make use of their bills, to push to the outer parts those eggs that were nearest to the middle of their nests, and to bring into the middle such as lay nearest the sides.

Mr Reaumur has invented a sort of low boxes, without bottoms, and lined with furs. These, which he calls artificial parents, not only shelter the chickens from the injuries of the air, but afford a kindly warmth, so that they presently take the benefit of their shelter as readily as they would have done under the wings of a hen. After hatching, it will be necessary to keep the chickens, for some time, in a room artfully heated and furnished with these boxes; but afterwards they may be safely exposed to the air in the court yard, in which it may not be amiss to place one of these artificial parents to shelter them if there should be occasion for it.

As to the manner of feeding the young brood, they are generally a whole day after being hatched, before they take any food at all; and then a few crumbs of bread

may be given them for a day or two, after which they will begin to pick up insects and grass for themselves.

But to save the trouble of attending them, capons may be taught to watch them in same manner as hens do. Mr Reaumur assures us, that he has seen above two hundred chickens at once, all led about and defended only by three or four such capons. Nay, cocks may be taught to perform the same office, which they, as well as the capons, will continue to do all their lives after.

15. LANGUAGE, in the most general meaning of the word, signifies any sound uttered by an animal, by which it expresses any of its passions, sensations, or affections; but it is more particularly understood to denote those various modifications of the human voice, by which the several sensations and ideas of one man are communicated to another.

Nature has endowed every animal with powers sufficient to communicate with others of the same species some of its sensations and desires. The organs of most animals are so formed, as readily to perceive and understand (as far as is necessary for their particular specie of existence) the voice of those of their own kind; by means of which they assemble together, for the defence or preservation of the species. But as they rise higher in the order of intellectual powers, the powers of expression likewise increase. However, the voice alone, even when endowed with a great extent of modulation, is incapable of conveying all that variety of emotions and sensations, which on many occasions are necessary to be communicated. In all these cases, motion and gesture are called in to supply the defects of the voice. The amorous pigeon does not trust solely to his plaintive cooing in order to soften the rigour of his reluctant mate, but adds to it the most submissive and expressive gestures; and the faithful dog, finding his voice alone insufficient to express his joy at meeting with his master, is obliged to have recourse to a variety of endearing actions. But man—the most distinguished of all the animal creation,—although endowed with a power of voice and expression of countenance and gesture eminently superior to all the creatures of God, finds that all these united are not sufficient to express the infinite variety of ideas with which his mind is stored: for although these may powerfully

express the passions and stronger feelings of the mind; yet as they are incapable of expressing the several progressive steps of perception by which his *reason* ascends from one degree of knowledge to another, he has been obliged to discover, by means of his reasoning faculty, a method of expressing with certainty, and communicating with the utmost facility, every perception of his mind.—With this view, having observed, that besides the power of uttering simple sounds, and the several variations of these into acute or grave, open or shrill, &c. by which his stronger feelings were naturally expressed, he was likewise endowed with a power of stoppage or interrupting these sounds, by certain closings of the lips with one another, and of the tongue with the palate, &c. he has taken advantage of these circumstances, and formed unto himself a language capable of expressing every perception of the mind; for by affixing at all times the same idea to any one sound or combination of sounds thus modified and joined together, he is enabled at any time to excite in the mind of any other person an idea similar to that in his own mind; provided the other person has been previously so far instructed as to know the particular modification of sound which has been agreed upon as the *symbol* of that idea. —Thus man is endowed with two different species of language: one consisting of tones and gestures; which as it is natural to man considered as a distinct species of animals, and necessary for the preservation and well-being of the whole, is universally understood by all mankind: thus laughter and mirth universally express cheerfulness of mind; while tears, in every part of the globe, discover a heart overflowing with tender sensations; and the humble tone of supplication, or the acute accent of pain, are equally understood by the Hurons of America, and by the more refined inhabitants of Europe. The other

species of language, as it is entirely artificial, and derives its power from particular compact (for before any thing can be recognized as the symbol of an idea, several persons must first agree that such an idea must always be denoted by this symbol), must be different in different parts of the globe; and every distinct form which it may assume, from the different genius of every society who originally formed a particular language for themselves, will be altogether unintelligible to every other body of men, but those belonging to the same society where that language was originally invented, or those who have been at pains to acquire a knowledge of it by means of study.

16. LAW, *Of Minors and their Tutors and Curators.*

The law concerning the state of children falls next to be explained. Children are either born in wedlock, or out of it. All children, born in lawful marriage or wedlock, are presumed to be begotten by the person to whom the mother is married; and consequently to be lawful children. The presumption is so strongly founded, that it cannot be defeated but by direct evidence that the mother's husband could not be the father of the child, *e.g.* where he is impotent, or was absent from the wife till within six lunar months of the birth. The canonists indeed maintain, that the concurring testimony of the husband and wife that the child was not procreated by the husband, is sufficient to elide this legal presumption for legitimacy; but it is an agreed point, that no regard is to be paid to such testimony, if it be made after they have owned the child to be theirs. A father has the absolute right of disposing of his children's person, of directing their education, and of moderate chastisement; and even after they become *puberes*, he may compel them to live in family with him, and to contribute their labour and industry, while they continue there, towards his service. A child who gets a separate stock from the father for carrying on any trade or employment, even though he should continue in the father's house, may be said to be emancipated or forisfamiated, in so far as concerns that stock; for the profits arising from it are his own. Forisfamiation, when taken in this sense, is also inferred by the child's marriage, or by his living in a separate house, with his father's permission or goodwill. Children, after their full age of twenty-one years, become, according to the general opinion, their own masters; and from that period are bound to the father only by the natural ties of duty, affection, and gratitude.

Children, born out of wedlock, are styled natural children, or bastards.

Bastards may be legitimated or made lawful, either, 1. By the subsequent intermarriage of the mother of the child with the father. And this sort of legitimation, intitles the child to all the rights of lawful children. The subsequent marriage, which produces legitimation, is considered by the law to have been entered into when the child legitimated was begotten; and hence, if he be a male, he excludes, by his right of primogeniture, the sons procreated after the marriage, from the succession of the father's heritage, though these sons were lawful children from the birth. Hence also, those children only can be thus legitimated, who are begotten of a woman whom the father might at that period have lawfully married. 2. Bastards are legitimated by letters of legitimation from the sovereign.

As to the powers of masters over servants: All servants now enjoy the same rights and privileges with other subjects, unless in so far as they are tied down by their engagement of service. Servants are either necessary or voluntary. Necessary are those whom law obliges to work without wages. Voluntary servants engage without compulsion, either for mere subsistence, or also for wages. Those who earn their bread in this way, if they should stand off from engaging, may be compelled to it by the Justices of the peace, who have power to fix the rate of their wages. Colliers, coal-bearers, and salters, and other persons necessary to collieries and saltworks, are tied down to perpetual service at the works to which they have once entered.

The poor make the lowest class or order of persons. Indigent children may be compelled to serve any of the king's subjects without wages, till their age of thirty years. Vagrants and sturdy beggars may be also compelled to serve any

manufacturer. And because few persons are willing to receive them into their service, public work-houses are ordained to be built for setting them to work. The poor who cannot work, must be maintained by the parishes in which they were born; and where the place of their nativity is not known, that burden falls upon the parishes where they have had their most common resort, for the three years immediately preceding their being apprehended, or their applying for the public charity. Where the contributions collected at the churches to which they belong, are not sufficient for their maintenance, they are to receive badges from the minister and kirk session, in virtue of which they may ask alms at the dwelling houses of the inhabitants of the parish.

17. LOGIC, *Of REASONING, Of the several kinds of reasoning; and first of that by which we determine the genera and species of things.*

All the aims of human reason may be reduced to these two: 1. To rank things under those universal ideas to which they truly belong; and, 2. To ascribe to them their several attributes and properties in consequence of that distribution.

One great aim of human reason is, to determine the genera and species of things. Now, as in universal propositions we affirm some property of a genus or species, it is plain, that we cannot apply this property to particular objects, till we have first determined whether they are comprehended under that general idea of which the property is affirmed. Thus there are certain properties belonging to all *even* numbers, which nevertheless cannot be applied to any particular number, until we have first discovered it to be of the species expressed by that general name. Hence reasoning begins with the referring things to their several divisions and classes in the scale of our ideas; and as these divisions are all distinguished by peculiar names, we hereby learn to apply the terms expressing general conceptions to such particular objects as come under our immediate observation.

Now, in order to arrive at these conclusions by which the several objects of perception are brought under general names, two things are manifestly necessary. First, that we take a view of the idea itself denoted by that general name, and carefully attend to the distinguishing marks which serve to characterize it. Secondly, that we compare this idea with the object under consideration, observing diligently wherein they agree or disagree. if the idea is found to correspond with the particular

object, we then without hesitation apply the general name; but if no such correspondence intervenes, the conclusion must necessarily take a contrary turn.

Hence it may be observed, that where the general idea to which particular objects are referred is very familiar to the mind, this reference and the application of the general name, seem to be made without any appearance of reasoning. When we see a horse in the fields, or a dog in the street, we readily apply the name of the species; habit, and a familiar acquaintance with the general idea, suggesting it instantaneously to the mind. We are not however to imagine on this account, that the understanding departs from the usual rules of just thinking. A frequent repetition of acts begets a habit; and habits are attended with a certain promptness of execution that prevents our observing the several steps and gradations by which any course of action is accomplished. But in other instances, where we judge not by pre-contracted habits, as when the general idea is very complex, or less familiar to the mind; we always proceed according to the form of reasoning established above. A goldsmith, for instance, who is in doubt as to any piece of metal, whether it be of the species called *gold*; first examines its properties, and then comparing them with the general idea signified by that name, if he finds a perfect correspondence, no longer hesitates under what class of metals to rank it.

Having thus explained the rules by which we are to conduct ourselves in ranking particular objects under general ideas, it remains only to observe, that the true way of rendering this part of knowledge both easy and certain, is, by habituating ourselves to clear and determinate ideas, and keeping them steadily annexed to their respective names. For as all our aim is, to apply general words aright; if these words

stand for invariable ideas, that are perfectly known to the mind, and can be readily distinguished upon occasion, there will be little danger of mistake or error in our reasonings. Let us suppose, that by examining any object, and carrying our attention successively from one part to another, we have acquainted ourselves with the several particulars observable in it. If among these we find such as constitute some general idea, framed and settled beforehand by the understanding, and distinguished by a particular name; the resemblance, thus known and perceived, necessarily determines the species of the object, and thereby gives it a right to the name by which that species is called. The same will be found to hold in all our other reasonings of this kind; where nothing can create any difficulty but the want of settled ideas.

Thus, we see, of what importance it is, towards the improvement and certainty of human knowledge, that we accustom ourselves to clear and determinate ideas, and a ready application of words.

18. MECHANICS, *Of MATTER and its Properties,*

Attraction of gravitation is that power by which different bodies tend towards one another. Of this we have daily instances in the falling of bodies to the earth. By this power in the earth it is, that bodies, on whatever side, fall in lines perpendicular to its surface; and consequently, on opposite sides, they fall in opposite directions; all towards the centre, where the force of gravity is as it were accumulated; and by this power it is, that bodies on the earth's surface are kept to it on all sides, so that they cannot fall from it. And as it acts upon all bodies in proportion to their respective quantities of matter, without any regard to their bulks or figures, it accordingly constitutes their weight. Hence,

If two bodies which contain equal quantities of matter, were placed at ever so great a distance from one another, and then left at liberty in free space; if there were no other bodies in the universe to affect them, they would fall equally swift towards one another by the power of gravity, with velocities accelerated as they approached each other; and would meet in a point which was half way between them at first. Or, if two bodies containing unequal quantities of matter, were placed at any distance, and left in the same manner at liberty, they would fall freely towards one another with velocities which would be in an inverse proportion to their respective quantities of matter; and moving faster and faster in their mutual approach, would at last meet in a point as much nearer to the place from which the heavier body began to fall, than to the place from which the lighter body began to fall, as the quantity of matter in the former exceeded that of the latter.

All bodies that we know of have gravity or weight. For, that there is no such thing as positive levity, even in smoke, vapours, and fumes, is demonstrable by experiments on the air-pump: which shews, that although the smoke of a candle ascends to the top of a tall receiver, when full of air; yet upon the air's being exhausted out of the receiver, the smoke falls down to the bottom of it. So, if a piece of wood be immersed in a jar of water, the wood will rise to the top of the water, because it has a less degree of weight than its bulk of water has; but if the jar be emptied of water, the wood falls to the bottom.

As every particle of matter has its proper gravity, this effect of the whole must be in proportion to the number of the attracting particles; that is, as the quantity of matter in the whole body. This is demonstrable by experiments on pendulums; for if they are of equal lengths, whatever their weights be, they vibrate in equal times. Now it is plain, that if one be double or triple the weight of another, it must require a double or triple power of gravity to make it move with the same celerity; just as it would require a double or triple force to project a bullet of twenty or thirty pound weight with the same degree of swiftness that a bullet of ten pounds would require. Hence, it is evident, that the power or force of gravity is always proportional to the quantity of matter in bodies, whatever their bulks or figures are.

Gravity also, like all other virtues or emanations which proceed or issue from a centre, decreases as the distance multiplied by itself increases: that is, a body at twice the distance of another attracts with only a fourth part of the force; at thrice the distance, with a ninth part; at four times with distance, with a sixteenth part; and so on. This too is confirmed by comparing the distance which the moon falls in a

minute from a right line touching her orbit, with the distance through which heavy bodies near the earth fall in that time; and also by comparing the forces which retain Jupiter's moons in their orbits, with their respective distances from Jupiter.

The velocity which bodies near the earth acquire in descending freely by the force of gravity is proportional to the times of their descent. For, as the power of gravity does not consist in a single impulse, but is always operating in a constant and uniform manner, it must produce equal effects in equal times; and consequently, in a double or triple time, a double or triple effect; and so, by acting uniformly on the body, must accelerate its motion proportionably to the time of its descent.

19. MEDICINE is generally defined to be, The art of preserving health when present, and of restoring it when lost.

Men would never think of any particular regimen or mode of living in order to preserve health, before they felt the pains which accompany the want of it. The first painful sensation must necessarily have produced a desire for relief. But in a period when physicians and medicines were equally unknown, how was that relief to be obtained? or what system of conduct would man in this situation naturally follow? Whoever can answer these questions, will unfold the genuine principles of the medical art, and give an infallible standard for judging what progress has been made in the improvement of it, what particular circumstances have contributed to obstruct or forward the knowledge and cure of diseases.

Medicine being thus founded on a powerful instinct in human nature, its existence in some form must have been coeval with the first disease that appeared among mankind. Most arts require the experience of ages before they can arrive at a high degree of perfection. Medicine is unquestionably one of the most ancient; and consequently, the improvement of it might be expected to bear some proportion to its antiquity. But, whilst philosophy, in all its branches, has been cultivated and improved to a great extent; medicine, notwithstanding the collateral advantage it has of late derived from anatomy and other sciences, still continues to be buried in rubbish and obscurity.

Many causes have contributed to retard our progress in the knowledge of the causes and cure of diseases. In the early ages, prescriptions were either the result of tradition founded upon uncertain facts, or mere random trials without any rational

view of success: Accordingly, when any uncommon case occurred, the patients were placed in cross-ways, and other public places, to receive the advice of passengers who might chance to know the disease or an efficacious remedy. In this way valuable medicines might be accidentally discovered. But memory, and, in remarkable cases, engravings on pillars or the walls of temples, were poor instruments for recording the symptoms of diseases, and the ingredients of prescriptions.

After the knowledge of medicine began to be studied and practiced as a liberal profession, a jealousy of reputation, joined to a thrift for money and ignorance of philosophy, laid a solid foundation for medical disputation. One party of physicians, known by the name of Empyrics, excluded all reasoning, and trusted solely to experience. Another party, called Dogmatists, maintained, that no man ought to prescribe, without being able to give a theory both of the disease and of the nature and action of the medicine. The principles of both these parties are unquestionably good. But the physician who excludes either of them, will make but little progress in the knowledge of his profession. A judicious mixture of the two is indispensably necessary. Indeed it is difficult to determine whether too great an attachment to empyricism or dogmatism has contributed most to obstruct the improvement of physic.

But there is one cause which has operated more powerfully in preventing the improvement of medicine than even a combination of all the other causes. Most branches of philosophy are principally cultivated by people who expect their reward in reputation, not in money. The practice of physic is become as literally a trade as any branch of business whatever. Young men are taught physic with no other view

than that of getting their bread. Whenever a physician gets into extensive practice, he may bustle and make a noise; but, even supposing his abilities to be great, he can never find leisure to think, or digest his observations.

Another cause of the imperfect state of medicine arises from the varieties in constitutions, and the complex nature of diseases. It is even extremely difficult, after a disease has been cured, to determine with certainty, whether the cure was performed by the operation of nature, or by any particular virtue in the medicine. This difficulty is greatly increased by the variety of different medicines, and different ingredients in the same medicine, which are commonly administered during the course of a disease.

Of late several attempts have been made to reduce medicine into the form of a regular science, by distributing diseases into classes, orders, genera, and species. The bare inspection of their numbers shews, that physicians are far from being agreed with regard to what constitutes the generic or specific characters of a disease. Indeed, we may venture to affirm, that they never will agree upon this point: The diagnostic symptoms of diseases are not so easily discovered as the stamina or petals in a flower, or the number of teeth or toes in a quadruped.

20. MORAL PHILOSOPHY - Duties to Society – *Concerning Marriage.*

When a man arrives to a certain age, he becomes sensible of a peculiar sympathy and tenderness towards the other sex; the charms of beauty engage his attention, and call forth new and softer dispositions than he has yet felt. The many amiable qualities exhibited by a fair outside, or by the mild allurements of female manners, or which the prejudiced spectator without much reasoning supposes those to include, with several other circumstances, point his view and affection to a particular object, and of course contract that general rambling regard, which was lost and useless among the undistinguished crowd, into a peculiar and permanent attachment to one woman, which ordinarily terminates in the most important, venerable, and delightful connection in life.

The state of the brute-creation is very different from that of human creatures. The former are clothed and generally armed by their structure, easily find what is necessary to their subsistence, and soon attain their vigour and maturity; so that they need the care and aid of their parents but for a short while; and therefore we see that nature has assigned to them vagrant and transient amours. The connection being purely natural, and formed merely for propagating and rearing their offspring; no sooner is that end answered, than the connection dissolves of course. But the human race are of a more tender and defenceless constitution; their infancy and non-age continue longer; they advance slowly to strength of body, and maturity of reason; they need constant attention, and a long series of cares and labours to train them up to decency, virtue, and the various arts of life. Nature has, therefore, provided them with the most affectionate and anxious tutors, to aid their weakness, to supply their

wants, and to accomplish them in those necessary arts; —even their own parents, on whom she has devolved this mighty charge, rendered agreeable by the most alluring and powerful of all ties, parental affection. But unless both concur in this grateful task, and continue their joint labours, till they have reared up and planted out their young colony, it must become a prey to every rude invader, and the purpose of nature in the original union of the human pair defeated. Therefore, our structure as well as condition is an evident indication, that the human sexes are destined for a more intimate, for a moral and lasting union. It appears likewise, that the principal end of marriage is not to propagate and nurse up an offspring, but to educate and form minds for the great duties and extensive destinations of life. Society must be supplied from this original nursery with useful members, and its fairest ornaments and supports.

The mind is apt to be dissipated in its views, and acts of friendship and humanity; unless the former be directed to a particular object, and the latter employed in a particular province. When men once indulge to this dissipation, there is no stopping their career; they grow insensible to moral attractions, and by obstructing or impairing the decent and regular exercise of the tender and generous feeling of the human heart, they in time become unqualified for, or averse to, the forming a moral union of souls, which is the cement of society, and the source of the purest domestic joys. Whereas a rational undepraved love, and its fair companion marriage, collect a man's views, guide his heart to its proper object, and by confining his affection to that object do really enlarge its influence and use. Besides, it is but too evident from the conduct of mankind, that the common ties of humanity are too feeble to engage and interest the passions of the generality in the affairs of society. The connections of

neighbourhood, acquaintance, and general intercourse, are too wide a field of action for many; and those of a public or community are so for more, and in which they either care not or know not how to exert themselves. Therefore nature, ever wise and benevolent, by implanting that strong sympathy which reigns between the individuals of each sex, and by urging them to form a particular moral connection, the spring of many domestic endearments, has measured out to each pair a particular sphere of action, proportioned to their views, and adapted to their respective capacities.

Besides, by interesting them deeply in the concerns of their own little circle, she has connected them more closely with society, which is composed of particular families, and bound them down to their good behaviour in that particular community to which they belong. This moral connection is marriage, and this sphere of action is a family.

21. MORAL PHILOSOPHY - Duties to Society – *Of Parental Duty.*

The connection of parents with their children is a natural consequence of the matrimonial connection, and the duties which they owe them result as naturally from that connection. The feeble state of children, subject to so many wants and dangers, requires their incessant care and attention; their ignorant and uncultivated minds demand their continual instruction and culture. Had human creatures come into the world with the full strength of men, and the weakness of reason and vehemence of passion which prevail in children, they would have been too strong or too stubborn to have submitted to the government and instruction of their parents. But, as they were designed for a progression in knowledge and virtue, it was proper that the growth of their bodies should keep pace with that of their minds, lest the purposes of that progression should have been defeated. Among other admirable purposes which this gradual expansion of their outward as well as inward structure serves, this is one, that it affords ample scope to the exercise of many tender and generous affections, which fill up the domestic life with a beautiful variety of duties and enjoyments; and are of course a noble discipline for the heart, and an hardy kind of education for the more honourable and important duties of public life.

The above mentioned weak and ignorant state of children, seems plainly to invest their parents with such authority and power as is necessary to their support, protection, and education: but that authority and power can be construed to extend no farther than that weakness and ignorance continue; wherefore, the foundation or reason of the authority and power ceasing, they cease of course. Whatever power or authority, then, it may be necessary or lawful for parents to exercise during the non-

age of their children, to assume or usurp the same when they have attained the maturity or full exercise of their strength and reason, would be tyrannical and unjust. From hence it is evident, that parents have no right to punish the persons of their children more severely than the nature of their wardship requires; much less to invade their lives, to encroach upon their liberty, or to transfer them as their property to any master whatsoever.

The first class of duties which parents owe their children respect their natural life; and these comprehend protection, nurture, provision, introducing them into the world in a manner suitable to their rank and fortune, and the like.

The second class of duties regards the intellectual and moral life of their children, or their education in such arts and accomplishments as are necessary to qualify them for performing the duties they owe to themselves and to others. As this was found to be the principal design of the matrimonial alliance, so the fulfilling that design is the most important and dignified of all the parental duties. In order therefore to fit the child for acting his part wisely, and worthily, as a man, as a citizen, and a creature of God, both parents ought to combine their joint wisdom, authority, and power, and each apart to employ those talents which are the peculiar excellency and adornment of their respective sex. The father ought to lay out and superintend their education; the mother to execute and manage the detail of which she is capable. The former should direct the manly exertion of the intellectual and moral powers of his child. His imagination, and the manner of those exertions, are the peculiar province of the latter. The former should advise, protect, command, and by his experience, masculine vigour, and their superior authority which is commonly

ascribed to his sex, brace and strengthen his pupil for active life, for gravity, integrity, and firmness in suffering. The business of the latter is to bend and soften her male pupil, by the charms of her conversation, and the softness and decency of her manners, for social life, for politeness of taste, and the elegant decorums of and enjoyments of humanity; and to improve and refine the tenderness and modesty of her female pupil, and form her to all those mild domestic virtues, which are the peculiar characteristics and ornaments of her sex.

To conduct the opening minds of their sweet charge through the several periods of their progress; to assist them in each period in throwing out the latent seeds of reason and ingenuity, and in gaining fresh accessions of light and virtue; and at length, with all these advantages, to produce the young adventurers upon the great theatre of human life, to play their several parts in the sight of their friends, of society, and mankind.

22. MYTHOLOGY

The word *mythology* is a Greek compound, that signifies a *discourse on fables*; and comprehends, in a collective sense, all the fabulous and poetic history of pagan antiquity. It follows, therefore, that this science teaches the history of the gods, demi-gods, and fabulous heroes of antiquity; the theology of the pagans, the principles of their religion, their mysteries, metamorphoses, oracles, &c.

If we well consider the matter, we shall find, that there were, in pagan antiquity, three different religions, First, That of the philosophers, who treated metaphysically of the nature, the attributes, and of the works of the Supreme Being. They endeavoured to discover the true God, and the manner in which he ought to be worshipped. It is not wonderful, that these men of exalted genius should in some degree ridicule, in their works, the two other positive religions, and those gods on whom they were founded; at the same time that they outwardly professed the established religion, in order to preserve the peace of society, and to avoid the persecutions of the legislature, and the insults of the populace. For in fact, was it possible for them to believe the pagan fables? Must they not foresee, that their religion would one day give place to another, while their own words would pass with their names to the latest posterity? And could they suffer the thought, that their reputation would be tarnished in the eyes of that posterity, by having it imagined they believed such idle tales as were broached by the priests of their times?

The second religion was that of paganism, which was the established religion of all the ancient nations except the Jews. This was the doctrine that was taught by the priests, and protected by the sovereigns. Its dogmas were demonstratively false,

but not always so absurd as may at first appear, especially if we annex to the divinities, and to the religious ceremonies of the pagans, a sense that is frequently mystic, and always allegoric; if we remember, that the first heathens deified those great men to whom the rest of mankind were indebted for any signal benefits, as Jupiter, Apollo, Ceres, Bacchus, Hercules, Aesculapius, &c., in order to induce others, as well of the present as future ages, to reverence and to imitate them. Would not an ancient pagan, if he were to return upon the earth, have specious arguments, at least, to support his religion, when he saw weak mortals beatify or canonize, merely by their own authority, other weak mortals (frequently mere pedants,) and place them in heaven, without the permission or approbation of the Supreme Being? Happy is it for mankind, when at different times sagacious pontiffs purge the calendar, and the brains of the people, from a herd of pretended saints, and prevent them, at least after their death, from doing injury to society, by interrupting the industry of the laborious inhabitants with keeping their festivals.

The third religion was idolatry, or the religion of the populace. For the common people, born to be deceived in every thing, confounding in their imagination the statues of the gods, the idols of their divinities, the emblems of their virtues and of religious worship, with the gods, divinities, virtues and worship themselves, adored these images, and proceeded to extravagancies the most ridiculous, and frequently most criminal, in their ceremonies, feasts, libations, sacrifices, &c. It is to be feared, that, as long as there are upon the earth men of our limited capacities, this triple religion will constantly subsist under different forms; and we are much deceived, if it may not be found under the empire of Christianity itself, notwithstanding the purity of

its doctrine. It will be easily conceived, that it is not of the religion of philosophers, nor that of the populace, of which we are to treat in this article of Mythology; but of that which subsisted under the authority of the magistracy and the priesthood, and consequently of paganism in general.

As far as we are able to judge by all the ancient authors we have read, the pagans adored the sovereign Lord of the universe under the name of *Fate* or *Destiny*, which we must not confound with *Fortune*, who was regarded as a subaltern divinity. Jupiter himself, all the gods, every animated being, the heavens, the earth, the whole frame of nature, was subservient to *Destiny*, and nothing could reverse its decrees. This divinity was so highly adorable, as to be above all rank; and was regarded as too supreme to be represented under any sensible image or statue, or to have any temple erected for his worship.

23. NEEDLE, a very common little instrument or utensil, made of steel, pointed at one end, and pierced at the other, used in sewing embroidery, tapestry, &c.

Needles make a very considerable article in commerce, though there is scarce any commodity cheaper, the consumption of them being almost incredible. The sizes are from n° 1, the largest, to n° 25, the smallest. In the manufacture of needles, German and Hungarian steel are of most repute.

In the making of them, the first thing is to pass the steel through a coal fire, and under a hammer, to bring it out of its square figure into a cylindrical one. This done, it is drawn through a large hole of a wire-drawing iron, and returned into the fire, and drawn through a second hole of the iron, smaller than the first, and thus successively from hole to hole, till it has acquired the degree of fineness required for the species of needles, observing every time it is to be drawn, that it be greased over with lard, to render it more manageable. The steel thus reduced to a fine wire, is cut in pieces of the length of the needles intended. These pieces are flatted at one end on the anvil, in order to form the head and eye; they are then put into the fire, to soften them farther; and thence taken out and pierced at each extreme of the flat part on the anvil, by force of a puncheon of well tempered steel, and laid on a leaden block to bring out, with another puncheon, the little piece of steel remaining in the eye. The corners are then filed off the square of the heads, and a little cavity filed on each side of the flat of the head; this done, the point is formed with a file, and the whole filed over; they are then laid to heat red hot on a long flat narrow iron, crooked at one end, in a charcoal fire, and when taken out thence are thrown into a bason of cold water to harden. On this operation a good deal depends; too much heat burns them, and too

little leaves them soft; the medium is learned by experience. When they are thus hardened, they are laid in an iron shovel on a fire more or less brisk in proportion to the thickness of the needles; taking care to move them from time to time. This serves to temper them; and take off their brittleness; great care here too must be taken of the degree of heat. They are then straightened one after another with the hammer, the coldness of the water used in hardening them having twisted the great part of them.

The next process is the polishing them. To do this, they take twelve or fifteen thousand needles, and range them in little heaps against each other on a piece of new buckram sprinkled with emery dust. The needles thus disposed, emery dust is thrown over them, which is again sprinkled with oil of olives; at least the whole is made up into a roll, well bound at both ends. This roll is then laid on a polishing table, and over it a thick plank loaden with stones, which two men work backwards and forwards a day and a half, or two days, successively, by which means the roll thus continually agitated by the weight and motion of the plank over it, the needles withinside being rubbed against each other with oil and emery are insensibly polished. After polishing, they are taken out, and the filth washed off them with hot water and soap: they are then wiped in hot bran, a little moistened, placed with the needles in a round box, suspended in the air by a cord, which is kept stirring till the bran and needles be dry. The needles thus wiped in two or three different brans, are taken out and put in wooden vessels, to have the good separated from those whose points or eyes have been broke either in polishing or in wiping; the points are then all turned the same way, and smoothed with an emery-stone turned with a wheel. This

operation finishes them, and there remains nothing but to make them into packets of two hundred and fifty each.

24. PAINTING, the art of representing natural bodies, and giving them an appearance of life, by the turn of lines, and the degrees of colours.

Whosoever would apply himself to painting, says Leonardo da Vinci, must in the first place learn perspective: this will enable him to dispose things in their proper places, and to give the due dimensions to each: having done this, he must learn to design; chusing for that purpose some able master, who at the same time may give him some insight into the colours of figures: he ought then to consult nature, to confirm himself in what he has already learnt; and, lastly, let him apply himself to the study and imitation of the greater masters, in order to get a habit of reducing what he has learnt into practice.

To judge of the goodness of a painting, it is necessary to establish to ourselves a system of rules to be applied occasionally; and to assist the judgment herein, the following rules have been laid down: 1. The subject must be finely imagined, and, if possible improved in the painter's hands; he must think well as an historian, poet, philosopher, or divine, and more especially as a painter, in making a wise use of all the advantages of his art, and in finding expedients to supply its defects. 2. The expression must be proper to the subject, and the characters of the persons; it must be strong, so that the dumb shew may be perfectly and readily understood: every part of the picture must contribute to this end; colours, animals, draperies, and especially the actions of the figures, and above all the airs of the heads. 3. There must be one principal light; and this, and all the subordinate ones, with the shadows and reposes, must make one entire and harmonious mass; the several parts must be well connected and contrasted, so as to render the whole as graceful to the eye, as a good piece of

musick to the ear. By this means the picture is not only more delightful, but better seen and comprehended. 4. The drawing must be just; nothing must be flat, lame, or ill proportioned; and these proportions should vary according to the characters of the persons drawn. 5. The colouring, whether gay or solid, must be natural, beautiful, and clean, and what the eye is delighted with, in shadows, as well as lights and middle tints; and whether the colours are laid on thick, or finely wrought, they must appear to be done by a light and accurate hand. Lastly, Nature must be the foundation that must be seen at the bottom; but nature must be raised and improved, not only from what is commonly seen, to what is but rarely met with, but even yet higher, from a judicious and beautiful idea in the painter's mind, so that grace and greatness may shine throughout more or less according to the subject.

Painting is of various kinds, according to the materials used, the matter upon which they are applied, and the manner of applying them; as painting in oil, in watercolours, fresco, &c.

The whole secret of painting in oil consists in grinding the colours with nut oil, or linseed oil; but the manner of working is very different from that in fresco, or in water, by reason the oil does not dry near so fast, which gives the painter an opportunity for touching and re-touching all the parts of his figures as often as he pleases; which in the other methods of painting is a thing impracticable. The figures done in oil are also capable of more force and boldness; insomuch that the black becomes blacker, when ground with oil, than with water; besides, all the colours mixing better together, makes the colouring the sweeter, more delicate and agreeable,

and gives an union and tenderness to the whole, inimitable in any of the other manners.

In the preparation of oil-colours, care must be taken that they be ground fine; that in putting them on a pallet, those which will not dry of themselves be mixed with drying oil, or other ingredients of a drying quality; and that the tinged colours be mixed in as small quantities as possible. As to the situation of the colours, the purest and strongest must be placed in the front of the piece, and the colouring varied according to the subject, time, and place. If the subject be grave, melancholy, or terrible, the general tint of the colouring must incline to brown and black, or red and gloomy; but it must be gay and pleasant, in subjects of joy and triumph.

25. PAPER

The method of making paper of linen or hempen-rags, is as follows. The linen-rags being carried to the mill, are first sorted, then washed very clean in puncheons, whose sides are grated with strong wires, and the bottoms bored full of holes. After this, they are fermented, by laying them in heaps close covered with sacking, till they sweat and rot, which is commonly done in four or five days. When duly fermented, they are twisted into handfuls, cut small, and thrown into oval mortars. These mortars are constantly supplied with water, by little troughs from a cistern, fed by buckets fixed to the several floats of a great wheel, which raises the wooden hammers for pounding the rags in the mortars. When the rags are beaten to a certain degree, called the first stuff, the pulp is removed into boxes, made like corn chandlers' bins, with the bottom-board aslant, and a little separation on the front for the water to drain away. The pulp of the rags being in, they take away as many of the front boards as are needful, and press the mass hard down with their hands; the next day they put on another board, and add more pulp, till the box is full; and here it remains mellowing a week, more or less, according to the weather. After this, the stuff is again put into clean mortars, and is beaten afresh, and removed into boxes, as before, in which state it is called the second stuff. The mass is beat a third time, till some of it being mixed with fair water, and brewed to and fro, appears like flour and water, without any lumps in it: it is then fit for the pit-mortar, where it is perfectly dissolved, and is then carried to the vat, to be formed into sheets of paper.

The vat is rightly primed, when the liquor has such a proportion of the pulp, as that the mould, on being dipped into it, will just take up enough to make a sheet of

paper of the thickness required. The mould is a kind of sieve exactly of the size of the paper to be made, and about an inch deep, the bottom being formed of fine brass wire, guarded underneath with sticks; and further, to strengthen the bottom, there are large wires placed in parallel lines, at equal distances, which form those lines visible in all white paper when held up to the light: the mark of the paper is also made in this bottom, by interweaving a large wire in any particular form. This mould the maker dips into the liquor, and gives it a shake as he takes it out, to clear the water from the pulp. He then slides it along a groove to the coucher, who turns out the sheet upon a felt laid upon a plank, and lays another felt on it; and returns the mould to the maker, who by this time has prepared a second sheet in another mould: and thus they proceed, laying alternately a sheet and a felt, till they have made six quires of paper, which is called a post. A post of paper being made, either the maker or coucher whistles; on which four or five men advance, one of whom draws it under the press, and the rest press it with great force, till all the water is squeezed from it; after which it is separated sheet by sheet from the felts, and laid regularly one sheet upon another; and having undergone a second pressing, it is hung up to dry. When sufficiently dried, it is taken off the lines, rubbed smooth with the hands, and laid by till sized, which is the next operation. For this they chuse a fine temperate day; and having boiled a proper quantity of clean parchment, or vellum shavings, in water, till it comes to a size, they prepare a fine cloth, on which they strew a due proportion of white vitriol and roch-alum finely powdered, and strain the size through it into a large tub; in which they dip as much paper at once as they can conveniently hold, and with a quick motion give every sheet its share of the size, which must be as hot as the hand

can well bear it. After this, the paper is pressed, hung up sheet by sheet to dry; and being taken down, is sorted, and what is only fit for outside-quires laid by themselves; it is then told into quires, which are folded and pressed. The broken sheets are commonly put together, and two of the worst quires are placed on the outside of every ream or bundle; and being tied up in wrappers, it is fit for sale.

26. SACRIFICE, a solemn act of religious worship, which consisted in dedicating or offering up something animate or inanimate upon an altar, by the hands of the priest, either as an expression of gratitude to the Deity for some signal mercy, or to acknowledge their dependance on him, or to conciliate his favour. The origin of sacrifice is by some attributed to the Phoenicians, but Porphyry ascribes it to the Egyptians, who first offered the first-fruits of their grounds to the gods, burning them upon an altar of turf; thus in the most ancient sacrifices there were neither living creatures, nor any thing costly or magnificent, and no myrrh or frankincense. At length they began to burn perfumes: and afterwards men leaving their ancient diet of herbs and roots, and beginning to use living creatures for food, they began also to change their sacrifices.

The manner of sacrificing among the Greeks and Romans was as follows. In the choice of the victim, they took care that it was without blemish or imperfection; its tail was not to be too small at the end; the tongue not black, nor the ears cleft; and that the bull was one that had never been yoked. The victim being pitched upon, they gilt his forehead and horns, especially if a bull, heifer, or cow. The head they also adorned with a garland of flowers, a woolen insula or holy fillet, whence hung two rows of chaplets with twisted ribbands; and on the middle of the body a kind of stole, pretty large, hung down on each side; the lesser victims were only adorned with garlands and bundles of flowers, together with white tufts or wreaths.

The victims thus prepared were brought before the altar; the lesser being driven to the place, and the greater led by an halter; when if they made any struggle, or refused to go, the resistance was taken for an ill omen, and the sacrifice frequently

was set aside. The victim thus brought was carefully examined, to see that there was no defect in it: then the priest, clad in his sacerdotal habit, and accompanied with the sacrificers and other attendants, and being washed and purified according to the ceremonies prescribed, turned to the right-hand and went round the altar, sprinkling it with meal and holy-water, and also besprinkling those that were present. Then the crier proclaimed with a loud voice, Who is here? To which the people replied, Many and good. The priest then having exhorted the people to join with him by saying, Let us pray, confessed his own unworthiness, acknowledging that he had been guilty of divers sins; for which he begged pardon of the gods, hoping that they would be pleased to grant his requests, accept the oblations offered them, and send them all health and happiness; and to this general form added petitions for each particular favours as were then desired. Prayers being ended, the priest took a cup of wine; and having tasted it himself, caused his assistants to do the like; and then poured forth the remainder between the horns of the victim. Then the priest or the crier, or sometimes the most honourable person in the company, killed the beast, by knocking it down, or cutting its throat. If the sacrifice was in honour of the celestial gods, the throat was turned up towards heaven: but if they sacrificed to the heroes or infernal gods, the victim was killed with its throat towards the ground. If by accident the beast escaped the stroke, leaped up after it, or expired with pain and difficulty, it was thought to be unacceptable to the gods. The beast being killed, the priest inspected its entrails, and made predictions from them. They then poured wine, together with frankincense, into the fire, to increase the flame, and then laid the sacrifice on the altar; which in the primitive times was burnt whole to the gods, and thence called an holocaust; but in

aftertimes, only part of the victim was consumed in the fire, and the remainder reserved for the sacrificers; the thighs, and sometimes the entrails, being burnt to their honour, the company feasted upon the rest. While the sacrifice was burning, the priest, and the person who gave the sacrifice, jointly prayed, laying their heads upon the altar. Sometimes they played upon musical instruments in the time of the sacrifice, and on some occasions they danced round the altar, singing sacred hymns in honour of the gods.

27. SILK, is properly an animal fluid, hardened by the air; being an extremely soft and glossy thread, spun by the silk worm, the body of which consists of eleven rings.

The humours found in the body of this insect approach to the nature of silk; since, on being rubbed in the hand, they leave a solid crust behind. In the sides of the belly, all about the ventricle, there are deposited a vast number of vessels, which contain the silky juice: these run with various windings and meanders to the mouth; and are so disposed, that the creature can discharge their contents at pleasure at the mouth; and according to the nature of the juices that they are supplied with, furnish different sorts of silk from them, all the fluid contents of these vessels hardening in the air into that sort of thread that we find the web or balls of this creature consist of.

As soon as the silk-worm is arrived at the size and strength necessary for beginning his cod, he makes his web; for it is thus they call that slight tissue which is the beginning and ground of this admirable work. This is his first day's employment. On the second he forms his folliculus or ball, and covers himself almost over with silk. The third day, he is quite hid; and the following days employs himself in thickening and strengthening his ball; always working from one single end, which he never breaks by his own fault; and which is so fine, and so long, that those who have examined it attentively think they speak within compass, when they affirm, that each ball contains enough silk to reach the length of six English miles.

In ten days time the ball is in its perfection, and is now to be taken down from the branches of the mulberry tree, where the worms have hung it. But this point requires a great deal of attention: for there are some worms more lazy than others;

and it is very dangerous waiting till they make themselves a passage, which usually happens about the fifteenth day of the month.

The first, finest, and strongest balls are kept for the grain, the rest are carefully wound; or if it is desired to keep them all, or if there be more than can be well wound at once, they lay them for some time in an oven moderately hot, or else expose them for several days successively in the greatest heats of the sun, in order to kill the insect, which, without this precaution, would not fail to open itself a way to go and use those new wings abroad it has acquired within.

Ordinarily, they only wind the more perfect balls, those that are double, or too weak, or too coarse, are laid aside, not as altogether useless, but that, being improper for winding, they are reserved to be drawn out into skains. The balls are of different colours; the most common are yellow, orange-colour, isabella, and flesh colour; there are some also of a sea-green, others of a sulphur colour, and others white; but there is no necessity for separating the colours and shades to wind them apart, as all the colours are to be lost in the future scouring and preparing of the silk.

The organcine silk is the best made in the country of Piedmont of any; and two threads are equal in fineness, that is, in smoothness, thickness, and length, for the thread of the first twist. For the second, it matters not whether the single thread be strong before the two are joined, unless to see whether the first twist prove well.

It is necessary that the silk be clean; and it is to be observed that the straw-coloured is generally the lightest, and the white the heaviest of all. The skains should be even, and all of an equality, which shews that they were wrought together: otherwise we may with justice suspect that it is refuse silk, and cannot be equally

drawn out and spun; for one thread will be shorter than the other, which is labour and loss.

It will also be requisite to search the bale more than once, and take from out of the parcels a skain to make an essay; for unless it be known, by trial, what one buys, there is the greatest danger of being cheated in this commodity. There are silks of Piedmont, which are very light and clean, and are to be preferred before any on the sale.

Appendix G: Knowledge Pre-assessment

Here is the beginning of an entry from the first edition of the *Encyclopædia Britannica* (1768-1771). Please give up to five points that you would expect to be discussed in this encyclopedia entry. Give as much detail as you can.

[beginning of the entry to be read]

Appendix H: Think Aloud Instructions

Many people talk to themselves while they read. What I am interested in for this study is what you think and do while you read a text. You can decide for yourself whether you would like to read the text silently or out loud, or do some of both. Do whatever feels most natural for you. I am interested in anything at all that you find yourself thinking about and doing as you read the text. For example, if you choose to reread parts of the text, please say so. If the text reminds you of something, please say so. Whatever you are thinking about or doing as you read is what I need you to say out loud. Do you have any questions?

To get you used to thinking aloud, I have a short practice passage for you. I will not record this one and you can take your time and get used to how it feels. Now, I would like you to read the passage and say out loud what you are thinking and doing.

Practice think-aloud passage

12. FUNERAL RITES, ceremonies accompanying the interment or burial of any person.

These rites differed among the ancients according to the different genius and religion of each country. The Egyptians, among the rest of their funeral rites, embalmed their dead.

Among the ancient Greeks, it was usual sometimes, before the interment, to put a piece of money into the mouth of the deceased, which was thought to be Charon's fare for wafting the departed over the infernal river. This ceremony was not used in those countries which were supposed to be situated in the neighbourhood of the infernal regions, and to lead thither by a ready and direct road. The corpse was likewise furnished with a cake, composed of flour, honey, &c. which was designed to appease the fury of Cerberus, the door-keeper of hell, and to procure the ghost a safe and quiet entrance.

During the time the corpse continued in the house, there stood before the door a vessel of water, the design of which was, that those concerned about the body might purify themselves by washing; it being the opinion of the Greeks, as well as of the Jews, that pollution was contracted by touching a dead body.

The ceremonies by which they expressed their sorrow for the death of their friends, were various; but it seems to have been a constant rule to recede as much as possible in habit and behaviour from their ordinary customs. For this reason they abstained from banquets and entertainments; they divested themselves of all ornaments; they tore, cut off, or shaved their hair, which they cast into the funeral

pile, to be consumed with the body of their deceased friend. Sometimes they threw themselves on the ground, and rolled in the dust, or covered their head with ashes; they beat their breasts, and even tore their flesh with their nails, upon the loss of a person they much lamented. When persons of rank, such as public magistrates, or great generals, died, the whole city put on a face of mourning; all public meetings were intermitted; the schools, baths, shops, temples, and all places of concourse were shut up.

Interring or laying out the dead in the ground, seems to have been the most ancient practice among the Greeks; though burning came afterwards to be generally used among them. It was customary to throw into the funeral pile those garments the deceased usually wore. The pile was lighted by one of the dead person's nearest relations or friends, who made payment and vows to the winds to assist the flames, that the body might quickly be reduced to ashes; and during the time the pile was burning, the dead person's friends stood by it, pouring libations of wine, and calling upon the deceased.

When Numa reformed the religion of Rome, he ordered that the pontiffs should have the care of the funeral ceremonies; which, in most respects, were like those of the Greeks already described.

The funeral rites among the Hebrews, were solemn and magnificent: when any person was dead, his relations and friends rent their cloaths; which custom is but faintly imitated by the modern Jews, who only cut off a bit of their garment, in token of affliction. It was usual to bend the dead person's thumb into the hand, and to fasten it in that position with a string; because the thumb then having the figure of the

name of God, they thought the devil would not dare to approach it. When they came to the burying-place, they made a speech to the dead in the following terms: "Blessed be God, who has formed thee, fed thee, maintained thee, and taken away thy life. O dead! he knows your numbers, and shall one day restore your life, &c." Then they spoke the elogium, or funeral oration, of the deceased, after which they said a prayer, called the righteousness of judgment; then turning the face of the deceased towards heaven, they called out, "Go in peace."

The ancient Christians testified their abhorrence of the Pagan custom of burning the dead; and always deposited the body entire in the ground: and it was usual to bestow the honour of embalming upon the martyrs at least, if not upon others. They prepared the body for burial, by washing it with water, and dressing it in a funeral attire. The exportation, or carrying forth of the body, was performed by near relations, or persons of such dignity as the circumstances of the deceased required. Psalmody, or singing of Psalms, was the great ceremony used in all funeral processions among the ancient Christians.

from:

Smellie, W. (Ed.). (1768-1771). *Encyclopædia Britannica* (Vols. I-III). Edinburgh, Scotland: Bell & Macfarquhar.

Appendix I: After-reading Tasks

1. Look back in the entry and highlight up to five sentences (or parts of sentences) that you would include in a summary of this entry.
2. Please tell in your own words what you learned from reading this entry.
3. Please give your evaluation of the reliability of the information presented in this entry.
4. Please give your evaluation of the presentation of the material in this entry.

Appendix J: Post-Reading Interview Questions

1. How did that seem to you as a reading experience?
2. Did you feel as though you read the same way throughout, or were there any differences between the entries?
3. Did you have any particular goal in mind as you were reading these entries?
4. I noticed that you did/said [] while you were reading the entry on []. Can you tell me more about what was going on there?
5. Do you have any other observations about your reading of these entries or about your reading in general that we haven't covered?

Appendix K: Reader Profiles on Dimensions of Maturity

ANDREW

Demographics: Age **Older (34)** | Experience **Very High (7 years)** | Area of Study

History

Experience of Learning to Read: **Ease** | **Enjoyment** | **Out-of-School**

School Experiences: Affect Mixed | **Text Analysis**

Out-of-School Experiences: Separation

Change as a Reader: Stable | Aspect = Reading Habits

Current Leisure Reading Habits: Hours Daily Regular (1) | Text Types Low (1)

Interest/Importance: **Very High** | Practical, Escape, Professional

During Reading: Cross-over NR | Author NR

Good Reading: Efficiency/Understanding

Self-Description: Low | Reading Habits Weak | Process Very Weak | Purpose **Strong**

| Stance NR

Approach: Depends | Aspect = Enjoyment, Effort

Goals: School/Work: Understand | Leisure: Escape, **Learn/Judge** | General: NR

Think-aloud Behaviors (Means): Message/Text **High (46.5%)** | Engagement Very

Low (10.75)

Outcomes (Means): Learned Middle (.75) | Reliability Middle (.75)

Bold indicates responses identified as belonging to possible maturity as a reader.

NR = No response, indicating that the participant did not address this aspect.

BENJAMIN

Demographics: Age Younger (25) | Experience Moderate (2.5 years) | Area of Study

English

Experience of Learning to Read: **Ease** | **Enjoyment** | **Out-of-School**

School Experiences: Affect **Positive** | **Text Analysis**

Out-of-School Experiences: Merging, Separation

Change as a Reader: Negative | Aspect = **Lens**

Current Leisure Reading Habits: Hours Daily Low (< 1) | Text Types Low (1)

Interest/Importance: Moderate | Professional

During Reading: Cross-over **Fiction, Non-fiction** | Author NR

Good Reading: **Message**

Self-Description: **High** | Reading Habits NR | Process **Strong** | Purpose NR | Stance

Mixed

Approach: **General** | Aspect = **Learning**

Goals: School/Work: NR | Leisure: Escape | General: **Learn/Judge**

Think-aloud Behaviors (Means): Message/Text Middle (28.3%) | Engagement **Very**

High (71.5)

Outcomes (Means): Learned Middle (.75) | Reliability **High (1.25)**

Bold indicates responses identified as belonging to possible maturity as a reader.

NR = No response, indicating that the participant did not address this aspect.

ANITA

Demographics: Age Younger (21) | Experience Low (.5 years) | Area of Study

Human Development

Experience of Learning to Read: **Ease** | **Enjoyment** | **Out-of-School**

School Experiences: Affect **Positive** | **Text Analysis**

Out-of-School Experiences: Merging, Separation

Change as a Reader: **Positive** | Aspect = Efficiency, **Effectiveness**, **Attitude**

Current Leisure Reading Habits: Hours Daily **High (3)** | Text Types **High (3)**

Interest/Importance: **Very High** | Current Events, Escape, Professional, **Self-**

Development

During Reading: Cross-over NR | Author NR

Good Reading: Efficiency/Understanding, **Message**

Self-Description: Moderate | Reading Habits **Strong** | Process Very Weak | Purpose

Strong | Stance **Strong**

Approach: **General** | Aspect = **Enjoyment**

Goals: School/Work: Understand, Analyze | Leisure: **Analyze** | General: NR

Think-aloud Behaviors (Means): Message/Text Middle (28.5%) | Engagement Low

(30.75)

Outcomes (Means): Learned Low (.25) | Reliability **High (1.50)**

Bold indicates responses identified as belonging to possible maturity as a reader.

NR = No response, indicating that the participant did not address this aspect.

CARL

Demographics: Age Younger (25) | Experience Low (.5 years) | Area of Study

Physics

Experience of Learning to Read: Ease NR | Enjoyment NR | **Out-of-School**

School Experiences: Affect **Positive** | Text Analysis NR

Out-of-School Experiences: Merging, Separation

Change as a Reader: **Positive** | Aspect = **Reading Habits**

Current Leisure Reading Habits: Hours Daily Regular (1) | Text Types **High (3)**

Interest/Importance: Low | Personal-Social, **Self-Development**

During Reading: Cross-over **Fiction** | Author **Present**

Good Reading: **Message, Reading Habits**

Self-Description: Low | Reading Habits Weak | Process Weak | Purpose **Very Strong**

| Stance NR

Approach: NR | Aspect = Enjoyment, Effort

Goals: School/Work: Understand, Analyze | Leisure: **Learn/Judge** | General: NR

Think-aloud Behaviors (Means): Message/Text **High (35.1%)** | Engagement **High**

(56.25)

Outcomes (Means): Learned Middle (.75) | Reliability Low (.5)

Bold indicates responses identified as belonging to possible maturity as a reader.

NR = No response, indicating that the participant did not address this aspect.

DAVID

Demographics: Age Middle (29) | Experience **High (5 years)** | Area of Study Physics

Experience of Learning to Read: Ease NR | Enjoyment NR | **Out-of-School**

School Experiences: Affect Mixed | Text Analysis NR

Out-of-School Experiences: **Merging**

Change as a Reader: **Positive** | Aspect = **Reading Habits**

Current Leisure Reading Habits: Hours Daily **High (2-3)** | Text Types **High (3)**

Interest/Importance: High-Conditional | Professional, **Self-Development**

During Reading: Cross-over **Fiction** | Author **Present**

Good Reading: Efficiency/Understanding, **Message**

Self-Description: Low | Reading Habits NR | Process Very Weak | Purpose Mixed |

Stance **Strong**

Approach: **General** | Aspect = **Evaluation**

Goals: School/Work: NR | Leisure: NR | General: **Learn/Judge**

Think-aloud Behaviors (Means): Message/Text **High (42.2%)** | Engagement Low

(22.5)

Outcomes (Means): Learned **High (1.25)** | Reliability **High (1.25)**

Bold indicates responses identified as belonging to possible maturity as a reader.

NR = No response, indicating that the participant did not address this aspect.

BONNIE

Demographics: Age Middle (29) | Experience Moderate (2 Years) | Area of Study

Education

Experience of Learning to Read: Ease NR | Enjoyment NR | School

School Experiences: Affect Mixed | **Text Analysis**

Out-of-School Experiences: Separation

Change as a Reader: Positive | Aspect = Efficiency

Current Leisure Reading Habits: Hours Daily Low (< 1) | Text Types Middle (2)

Interest/Importance: High-Conditional | Professional, **Self-Development**

During Reading: Cross-over NR | Author NR

Good Reading: **Message, Goal**

Self-Description: Moderate | Reading Habits NR | Process Weak | Purpose **Strong** |

Stance **Strong**

Approach: Depends | Aspect = Effort

Goals: School/Work: Understand, Analyze | Leisure: NR | General: NR

Think-aloud Behaviors (Means): Message/Text Low (18.2%) | Engagement Very

High (59.0)

Outcomes (Means): Learned Low (.25) | Reliability Middle (1.00)

Bold indicates responses identified as belonging to possible maturity as a reader.

NR = No response, indicating that the participant did not address this aspect.

EDWARD

Demographics: Age Middle (31) | Experience Moderate (3 Years) | Area of Study

Education

Experience of Learning to Read: Ease NR | Enjoyment NR | **Out-of-School**

School Experiences: Affect Mixed | Text Analysis NR

Out-of-School Experiences: **Merging**

Change as a Reader: Positive | Aspect = Efficiency

Current Leisure Reading Habits: Hours Daily Regular (1) | Text Types Middle (2)

Interest/Importance: Moderate | Professional

During Reading: Cross-over NR | Author NR

Good Reading: Efficiency/Understanding, **Message**

Self-Description: Moderate | Reading Habits Weak | Process Mixed | Purpose Mixed |

Stance NR

Approach: Depends | Aspect = Enjoyment, Effort, Evaluation, Learning

Goals: School/Work: NR | Leisure: NR | General: NR

Think-aloud Behaviors (Means): Message/Text Middle (25.7%) | Engagement **Very**

High (87.5)

Outcomes (Means): Learned Middle (.75) | Reliability Middle (1.0)

Bold indicates responses identified as belonging to possible maturity as a reader.

NR = No response, indicating that the participant did not address this aspect.

CORA

Demographics: Age Younger 26 | Experience Low (1 Year) | Area of Study Human
Development

Experience of Learning to Read: Difficulty | Enjoyment NR | **Out-of-School**, School

School Experiences: Affect Mixed | Text Analysis NR

Out-of-School Experiences: Merging, Separation

Change as a Reader: **Positive** | Aspect = **Reading Habits, Attitude**

Current Leisure Reading Habits: Hours Daily Regular (1) | Text Types Middle (2)

Interest/Importance: High-Conditional | Professional

During Reading: Cross-over **Fiction** | Author NR

Good Reading: Efficiency/Understanding

Self-Description: Moderate | Reading Habits **Strong** | Process Mixed | Purpose

Strong, | Stance **Strong**

Approach: **General**, Depends | Aspect = Enjoyment, **Learning**

Goals: School/Work: Understand | Leisure: Answer Questions, Escape | General: NR

Think-aloud Behaviors (Means): Message/Text Middle (22.7%) | Engagement Low

(16.5)

Outcomes (Means): Learned Low (0) | Reliability Low (.25)

Bold indicates responses identified as belonging to possible maturity as a reader.

NR = No response, indicating that the participant did not address this aspect.

FREDERICK

Demographics: Age **Older (34)** | Experience **Very High (7.5 Years)** | Area of Study

Ecology

Experience of Learning to Read: **Ease** | **Enjoyment** | School

School Experiences: Affect Mixed | **Text Analysis**

Out-of-School Experiences: Merging, Separation

Change as a Reader: **Positive** | Aspect = **Effectiveness**

Current Leisure Reading Habits: Hours Daily **High (4-6)** | Text Types **High (3)**

Interest/Importance: **Very High** | Practical, Professional, **Self-Development**

During Reading: Cross-over **Fiction, Nonfiction** | Author NR

Good Reading: Efficiency/Understanding

Self-Description: **High** | Reading Habits Mixed | Process **Strong** | Purpose Mixed |

Stance NR

Approach: **General**, Depends | Aspect = Effort, Enjoyment, **Learning**

Goals: School/Work: NR | Leisure: NR | General: **Learn/Judge**

Think-aloud Behaviors (Means): Message/Text **High (48.1%)** | Engagement **Very**

High (69.75)

Outcomes (Means): Learned Middle (1.0) | Reliability Middle (1.0)

Bold indicates responses identified as belonging to possible maturity as a reader.

NR = No response, indicating that the participant did not address this aspect.

DEBORAH

Demographics: Age **Older (33)** | Experience **High (4.5 Years)** | Area of Study

Ecology/Biology

Experience of Learning to Read: Ease NR | **Enjoyment** | **Out-of-School**

School Experiences: Affect **Positive** | **Text Analysis**

Out-of-School Experiences: **Merging**

Change as a Reader: **Positive** | Aspect = **Effectiveness**

Current Leisure Reading Habits: Hours Daily **High (2)** | Text Types **High (3)**

Interest/Importance: High-Conditional | Escape, Professional

During Reading: Cross-over **Non-fiction** | Author NR

Good Reading: Efficiency/Understanding

Self-Description: Low | Reading Habits **Strong** | Process Mixed | Purpose NR |

Stance NR

Approach: **General**, Depends | Aspect = **Enjoyment**, Effort

Goals: School/Work: Analyze, **Share** | Leisure: NR | General: NR

Think-aloud Behaviors (Means): Message/Text **High (38.5%)** | Engagement Very

Low (9.75)

Outcomes (Means): Learned **High (2.0)** | Reliability Middle (1.0)

Bold indicates responses identified as belonging to possible maturity as a reader.

NR = No response, indicating that the participant did not address this aspect.

EMMA

Demographics: Age Middle 31 | Experience **High (4 Years)** | Area of Study Botany

Experience of Learning to Read: Ease NR | Enjoyment NR | School NR

School Experiences: Affect **Positive** | Text Analysis No

Out-of-School Experiences: Merging, Separation

Change as a Reader: **Positive** | Aspect = **Reading Habits**, Efficiency

Current Leisure Reading Habits: Hours Daily **High (2)** | Text Types Middle (2)

Interest/Importance: High-Conditional | Escape, Professional

During Reading: Cross-over NR | Author NR

Good Reading: Efficiency/Understanding

Self-Description: Moderate | Reading Habits NR | Process Weak | Purpose **Strong** |

Stance NR

Approach: Depends | Aspect = Effort

Goals: School/Work: Understand | Leisure: NR | General: NR

Think-aloud Behaviors (Means): Message/Text **High (51.2%)** | Engagement Very

Low (10.25)

Outcomes (Means): Learned **High (1.5)** | Reliability **High (1.25)**

Bold indicates responses identified as belonging to possible maturity as a reader.

NR = No response, indicating that the participant did not address this aspect.

GEORGE

Demographics: Age Younger (23) | Experience Moderate (2 Years) | Area of Study

Botany

Experience of Learning to Read: Ease NR | Enjoyment NR | School

School Experiences: Affect NR | **Text Analysis**

Out-of-School Experiences: **Merging**

Change as a Reader: Mixed | Aspect = Attitude (Negative), Efficiency (Positive)

Current Leisure Reading Habits: Hours Daily Low (< 1) | Text Types Middle (2)

Interest/Importance: High-Conditional | Importance NR

During Reading: Cross-over NR | Author NR

Good Reading: **Message, Reading Habits**

Self-Description: **High** | Reading Habits **Strong** | Process Mixed | Purpose **Strong** |

Stance NR

Approach: **General** | Aspect = **Learning**

Goals: School/Work: Understand, **Share** | Leisure: Escape, **Learn/Judge** | General:

NR

Think-aloud Behaviors (Means): Message/Text Middle (30.3%) | Engagement Low

(21.5)

Outcomes (Means): Learned Low (.25) | Reliability Middle (1.0)

Bold indicates responses identified as belonging to possible maturity as a reader.

NR = No response, indicating that the participant did not address this aspect.

FRANCES

Demographics: Age Younger (27) | Experience Moderate (3 Years) | Area of Study

Botany

Experience of Learning to Read: **Ease** | **Enjoyment** | **Out-of-School**

School Experiences: Affect Mixed | **Text Analysis**

Out-of-School Experiences: **Merging**

Change as a Reader: Negative | Aspect = Reading Habits

Current Leisure Reading Habits: Hours Daily Regular (1) | Text Types **High (3)**

Interest/Importance: **Very High** | Escape, Professional, **Self-Development**

During Reading: Cross-over **Non-fiction** | Author **Present**

Good Reading: Efficiency/Understanding, **Message, Attitude**

Self-Description: **High** | Reading Habits **Very Strong** | Process **Very Strong** |

Purpose Weak | Stance **Strong**

Approach: **General** | Aspect = **Learning**

Goals: School/Work: Analyze, **Share** | Leisure: **Learn/Judge**, Answer Questions |

General: Understand, **Share**

Think-aloud Behaviors (Means): Message/Text **High (39.4%)** | Engagement **High**

(48.25)

Outcomes (Means): Learned **High (2.0)** | Reliability **High (1.25)**

Bold indicates responses identified as belonging to possible maturity as a reader.

NR = No response, indicating that the participant did not address this aspect.

HERBERT

Demographics: Age Middle (28) | Experience Low (1 year) | Area of Study Botany

Experience of Learning to Read: **Ease** | **Enjoyment** | **Out-of-School**, School

School Experiences: Affect **Positive** | Text Analysis NR

Out-of-School Experiences: Merging, Separation

Change as a Reader: Positive | Aspect = Efficiency

Current Leisure Reading Habits: Hours Daily Low (< 1) | Text Types **High (3)**

Interest/Importance: High-Conditional | Professional, **Self-Development**

During Reading: Cross-over NR | Author NR

Good Reading: **Message, Reading Habits**

Self-Description: Moderate | Reading Habits NR | Process Mixed | Purpose NR |

Stance NR

Approach: Depends | Aspect = Effort

Goals: School/Work: Understand | Leisure: Escape | General: NR

Think-aloud Behaviors (Means): Message/Text Middle (26.0%) | Engagement Very

Low (7.67)

Outcomes (Means): Learned Middle (1.0) | Reliability Middle (1.0)

Bold indicates responses identified as belonging to possible maturity as a reader.

NR = No response, indicating that the participant did not address this aspect.

GLORIA

Demographics: Age **Older (34)** | Experience **Very High (7 Years)** | Area of Study

Theology

Experience of Learning to Read: Ease NR | Enjoyment NR | **Out-of-School**

School Experiences: Affect Mixed | Text Analysis NR

Out-of-School Experiences: Merging, Separation

Change as a Reader: **Positive** | Aspect = **Lens**

Current Leisure Reading Habits: Hours Daily Regular (1) | Text Types **High (3)**

Interest/Importance: **Very High** | Professional, **Self-Development**

During Reading: Cross-over **Fiction** | Author NR

Good Reading: Efficiency/Understanding, **Message**

Self-Description: Low | Reading Habits Weak | Process Very Weak | Purpose **Strong**

| Stance NR

Approach: **General** | Aspect = **Effort, Learning**

Goals: School/Work: Answer Questions, **Learn/Judge** | Leisure: NR | General: NR

Think-aloud Behaviors (Means): Message/Text **High (42.5%)** | Engagement **High**

(53.0)

Outcomes (Means): Learned Middle (.75) | Reliability **High (1.5)**

Bold indicates responses identified as belonging to possible maturity as a reader.

NR = No response, indicating that the participant did not address this aspect.

HANNAH

Demographics: Age Middle (30) | Experience Moderate (3 Years) | Area of Study

Education

Experience of Learning to Read: **Ease** | **Enjoyment** | **Out-of-School**

School Experiences: Affect NR | Text Analysis No

Out-of-School Experiences: Separation NR

Change as a Reader: Stable | Aspect = Attitude

Current Leisure Reading Habits: Hours Daily Low (< 1) | Text Types Low (1)

Interest/Importance: **Very High** | Escape

During Reading: Cross-over NR | Author NR

Good Reading: Efficiency/Understanding, **Attitude**

Self-Description: **High** | Reading Habits NR | Process **Very Strong** | Purpose Weak |

Stance NR

Approach: Depends | Aspect = Enjoyment, Effort

Goals: School/Work: Understand | Leisure: NR | General: NR

Think-aloud Behaviors (Means): Message/Text Middle (28.1%) | Engagement Very

Low (8.0)

Outcomes (Means): Learned Low (0) | Reliability Low (.25)

Bold indicates responses identified as belonging to possible maturity as a reader.

NR = No response, indicating that the participant did not address this aspect.

JEFFREY

Demographics: Age **Older (45)** | Experience Low (1 Year) | Area of Study

Psychology

Experience of Learning to Read: Difficulty | Enjoyment NR | School

School Experiences: Affect **Positive** | **Text Analysis**

Out-of-School Experiences: Merging, Separation

Change as a Reader: **Positive** | Aspect = Efficiency, **Effectiveness**

Current Leisure Reading Habits: Hours Daily **High (1-2)** | Text Types Middle (2)

Interest/Importance: High-Conditional | Professional, Escape, Current Events

During Reading: Cross-over **Non-fiction** | Author NR

Good Reading: **Message**

Self-Description: Moderate | Reading Habits Very Weak | Process Weak | Purpose

Strong | Stance NR

Approach: Depends | Aspect = Enjoyment, Effort, Evaluation, Learning

Goals: School/Work: Understand | Leisure: Escape | General: NR

Think-aloud Behaviors (Means): Message/Text **High (43.8%)** | Engagement Very

Low (12.0)

Outcomes (Means): Learned Middle (1.0) | Reliability Low (.5)

Bold indicates responses identified as belonging to possible maturity as a reader.

NR = No response, indicating that the participant did not address this aspect.

JENNIFER

Demographics: Age **Older (32)** | Experience **High (5 Years)** | Area of Study Special

Education

Experience of Learning to Read: **Ease** | **Enjoyment** | **Out-of-School**, School

School Experiences: Affect **Positive** | **Text Analysis**

Out-of-School Experiences: **Merging**

Change as a Reader: **Positive** | Aspect = **Reading Habits**

Current Leisure Reading Habits: Hours Daily Regular (1) | Text Types **High (4)**

Interest/Importance: **Very High** | Escape, **Self-Development**

During Reading: Cross-over **Fiction** | Author **Present**

Good Reading: Efficiency/Understanding, **Message**

Self-Description: Moderate | Reading Habits Weak | Process NR | Purpose Weak |

Stance **Very Strong**

Approach: **General** | Aspect = **Enjoyment, Effort**

Goals: School/Work: **Share** | Leisure: Escape | General: NR

Think-aloud Behaviors (Means): Message/Text Low (20.5%) | Engagement Very

High (80.5)

Outcomes (Means): Learned Middle (1.0) | Reliability Middle (.75)

Bold indicates responses identified as belonging to possible maturity as a reader.

NR = No response, indicating that the participant did not address this aspect.

LINDA

Demographics: Age Younger (26) | Experience Low (0 Years) | Area of Study

Psychology

Experience of Learning to Read: Ease NR | Enjoyment NR | **Out-of-School**

School Experiences: Affect **Positive** | **Text Analysis**

Out-of-School Experiences: Separation NR

Change as a Reader: Negative | Aspect = Attitude

Current Leisure Reading Habits: Hours Daily **High (1-2)** | Text Types Middle (2)

Interest/Importance: **Very High** | **Self-Development**

During Reading: Cross-over **Non-fiction** | Author **Present**

Good Reading: **Attitude**

Self-Description: **High** | Reading Habits **Strong** | Process Mixed | Purpose **Strong** |

Stance Weak

Approach: Depends | Aspect = Enjoyment, Effort

Goals: School/Work: NR | Leisure: NR | General: **Learn/Judge**

Think-aloud Behaviors (Means): Message/Text Middle (21.1%) | Engagement Low

(30.75)

Outcomes (Means): Learned **High (1.5)** | Reliability Middle (1.0)

Bold indicates responses identified as belonging to possible maturity as a reader.

NR = No response, indicating that the participant did not address this aspect.

LEWIS

Demographics: Age **Older (32)** | Experience High (4 Years) | Area of Study

Education

Experience of Learning to Read: **Ease** | **Enjoyment** | School NR

School Experiences: Affect Mixed | Text Analysis NR

Out-of-School Experiences: Separation

Change as a Reader: **Positive** | Aspect = **Reading Habits, Lens**

Current Leisure Reading Habits: Hours Daily Low (< 1) | Text Types Middle (2)

Interest/Importance: Enthusiasm NR | Personal-Social

During Reading: Cross-over NR | Author NR

Good Reading: **Goal**

Self-Description: Moderate | Reading Habits Mixed | Process Weak | Purpose NR |

Stance **Strong**

Approach: Depends | Aspect = Enjoyment, Learning

Goals: School/Work: Understand, **Learn/Judge** | Leisure: NR | General: NR

Think-aloud Behaviors (Means): Message/Text Low (8.2%) | Engagement Very High

(69.0)

Outcomes (Means): Learned Low (.33) | Reliability Low (0)

Bold indicates responses identified as belonging to possible maturity as a reader.

NR = No response, indicating that the participant did not address this aspect.

MARTHA

Demographics: Age Middle (28) | Experience **High (4.5 Years)** | Area of Study

Education

Experience of Learning to Read: Ease NR | **Enjoyment** | School

School Experiences: Affect **Positive** | **Text Analysis**

Out-of-School Experiences: Separation

Change as a Reader: **Positive** | Aspect = **Reading Habits**

Current Leisure Reading Habits: Hours Daily Low (< 1) | Text Types Middle (2)

Interest/Importance: Moderate | Professional

During Reading: Cross-over NR | Author NR

Good Reading: Decoding, **Message, Reading Habits**

Self-Description: Moderate | Reading Habits Weak | Process Weak | Purpose **Strong** |

Stance NR

Approach: **General** | Aspect = **Enjoyment**

Goals: School/Work: Understand, Analyze, **Share** | Leisure: NR | General: NR

Think-aloud Behaviors (Means): Message/Text Low (6.4%) | Engagement High

(39.0)

Outcomes (Means): Learned Middle (1.0) | Reliability Middle (1.0)

Bold indicates responses identified as belonging to possible maturity as a reader.

NR = No response, indicating that the participant did not address this aspect.

NORA

Demographics: Age Middle (30) | Experience **High (5 Years)** | Area of Study

Education

Experience of Learning to Read: Ease NR | Enjoyment NR | **Out-of-School**

School Experiences: Affect Negative | **Text Analysis**

Out-of-School Experiences: **Merging**

Change as a Reader: **Positive** | Aspect = **Effectiveness, Lens**

Current Leisure Reading Habits: Hours Daily Low (< 1) | Text Types **High (3)**

Interest/Importance: **Very High** | Practical, Professional, **Self-Development**

During Reading: Cross-over **Fiction** | Author NR

Good Reading: Decoding, Efficiency/Understanding, **Goal, Attitude**

Self-Description: Moderate | Reading Habits Weak | Process **Strong** | Purpose Very

Weak | Stance **Strong**

Approach: **General** | Aspect = **Enjoyment, Learning, Evaluation**

Goals: School/Work: **Share** | Leisure: **Share** | General: **Analyze, Answer Questions,**

Share

Think-aloud Behaviors (Means): Message/Text Low (10.4%) | Engagement High

(52.75)

Outcomes (Means): Learned Low (.5) | Reliability **High (1.25)**

Bold indicates responses identified as belonging to possible maturity as a reader.

NR = No response, indicating that the participant did not address this aspect.

PAMELA

Demographics: Age Middle (30) | Experience **Very High (6 Years)** | Area of Study

Human Development

Experience of Learning to Read: Ease NR | Enjoyment NR | School NR

School Experiences: Affect **Positive** | **Text Analysis**

Out-of-School Experiences: **Merging**

Change as a Reader: **Positive** | Aspect = **Attitude**

Current Leisure Reading Habits: Hours Daily Regular (1) | Text Types Middle (2)

Interest/Importance: High-Conditional | Escape, Professional, **Self-Development**

During Reading: Cross-over NR | Author NR

Good Reading: Efficiency/Understanding, **Message**

Self-Description: Moderate | Reading Habits Weak | Process **Very Strong** | Purpose

NR | Stance NR

Approach: **General** | Aspect = **Enjoyment**

Goals: School/Work: Analyze | Leisure: Escape | General: NR

Think-aloud Behaviors (Means): Message/Text Low (17.0%) | Engagement Low

(22.0)

Outcomes (Means): Learned Middle (1.0) | Reliability (1.0)

Bold indicates responses identified as belonging to possible maturity as a reader.

NR = No response, indicating that the participant did not address this aspect.

REGINA

Demographics: Age Younger (25) | Experience Moderate (3 Years) | Area of Study

Psychology

Experience of Learning to Read: Ease NR | **Enjoyment** | **Out-of-School**

School Experiences: Affect **Positive** | **Text Analysis**

Out-of-School Experiences: **Merging**

Change as a Reader: Negative | Aspect = Reading Habits

Current Leisure Reading Habits: Hours Daily Regular (1) | Text Types **High (4)**

Interest/Importance: High-Conditional | Professional

During Reading: Cross-over **Fiction** | Author NR

Good Reading: Efficiency/Understanding, **Message**

Self-Description: **High** | Reading Habits NR | Process Mixed | Purpose NR | Stance

NR

Approach: NR

Goals: School/Work: Understand, Analyze | Leisure: Escape, **Learn/Judge** | General:

NR

Think-aloud Behaviors (Means): Message/Text Low (2.5%) | Engagement High

(39.0)

Outcomes (Means): Learned Low (0) | Reliability Middle (1.0)

Bold indicates responses identified as belonging to possible maturity as a reader.

NR = No response, indicating that the participant did not address this aspect.

SUSAN

Demographics: Age **Older (59)** | Experience Moderate (2 Years) | Area of Study

Education

Experience of Learning to Read: **Ease** | **Enjoyment** | **Out-of-School**

School Experiences: Affect Mixed | **Text Analysis**

Out-of-School Experiences: **Merging**

Change as a Reader: **Positive** | Aspect = **Effectiveness**

Current Leisure Reading Habits: Hours Daily NR | Text Types **High (3)**

Interest/Importance: **Very High** | Escape, Practical, **Self-Development**

During Reading: Cross-over **Non-fiction** | Author NR

Good Reading: Efficiency/Understanding, **Goal**

Self-Description: **High** | Reading Habits **Very Strong** | Process Mixed | Purpose

Weak | Stance **Very Strong**

Approach: Depends | Aspect = Enjoyment

Goals: School/Work: NR | Leisure: Answer Questions, Escape, **Learn/Judge** |

General: NR

Think-aloud Behaviors (Means): Message/Text Middle (21.9%) | Engagement **Very**

High (84.5)

Outcomes (Means): Learned Middle (1.0) | Reliability **High (2.0)**

Bold indicates responses identified as belonging to possible maturity as a reader.

NR = No response, indicating that the participant did not address this aspect.

Appendix L: Coding Schemes for Structured Interview Data

Question 1: Learning to Read

Easiness/Mastery or Difficulty

Ease

"I never really had trouble reading" (Andrew)

"it came pretty quickly" (Benjamin)

"I wouldn't even have to read them, but I just knew, like, all the words to the books"

(Anita)

Difficulty

"I think I remember it as being kind of difficult" (Cora)

"I actually had issues, I think, with reading early on" (Herbert)

NR (no relevant content in the response)

Enjoyment

Enjoyment

"it was very exciting for me" (Frances)

"I really enjoyed that" (Benjamin)

"that was one of my favorite memories" (Cora)

"I loved that, and I liked to read at the time" (Lewis)

NR (no relevant content in the response)

School or Out of School

School

"I tried to tackle that in first grade" (Benjamin)

"I can tell you a bit about the schooling system I went to...we started learning letters"

(Bonnie) "I didn't, I don't think I even learned to read until I was in first grade" (Cora)

"I remember a little bit about the alphabet in maybe kindergarten, first grade"

(George)

Out of School

"I remember very early as a child, my parents had, we had the books on tape..."

(Andrew)

"my dad read to us out loud, a lot" (Benjamin)

"I remember reading books with my parents a lot" (Anita)

"I remember being very excited riding in the car, being able to say what was on the signs that we were passing" (Frances)

NR (no relevant content in the response)

Question 2: School Experiences

Affect or Enjoyment

Positive

"high school was good" (Andrew)

"those were the best reading years" (Benjamin)

"I always liked the books that they read, and I loved going to the [school] library"

(Anita)

Negative

"I remember being irritated" (Andrew)

"I remember not liking it" (Cora)

"I remember being, I guess, frustrated" (Frederick)

NR (no relevant content in the response)

Text Analysis

Yes

"I was in an IB class... We had to, we had to like explicate passages" (Anita)

"The only recollection is doing that with poems, especially like really emotional poems like, why did he use the word, you know, cyan instead of green" (George)

"In high school, especially for the English classes, we approached all the reading in the, in the same way. And so we were always answering the question of how is the author using language to create meaning" (Frances)

No

"I actually dropped out of high school and I got my GED, and when I took the GED exam, I had to read an essay and write an essay about what I had just read as part of my comprehension exam for my GED, and when you said really critically, I mean I was going for my equivalency diploma, and that's probably the most critically I'd ever read anything" (Emma)

"I guess as a philosophy major we did so some of that, but it was always with philosophy type texts, so ... so I don't know that I necessarily would have that skill to do with just a general piece of text" (Hannah)

NR (no relevant content in the response)

Question 3: Out-of-School Experiences

Compartmentalization

Merging

"I still, like, even, you know, throughout college, read also, um, like fiction books, and um, but I did get a little bit more into, like, the, the memoirs. I was interested in, like, the people writing more their own stories, and, stuff like that, so" (Anita)

"One thing I remember is reading about this book, in Palmer, in the history text, called A Day in the Life of Ivan Denisovich, and there was some reason that it was mentioned in the text, and then I found it on our bookshelves, and we had it, and so I read it, and I was surprised that it was readable and interesting, because it had been mentioned in a history book, and it was totally, bonus and extra and I didn't have to have read it" (Frances)

[Did you read mostly nonfiction, or did you read fiction, or both?] "Both. Because, so I read, some of that was historical accounts of important people, things, people that I read or heard about, or sports figures" (Jeffrey)

Separation

"I remember not enjoying, um, like history textbooks and, I don't, I don't have pleasant memories of reading in school... I did a lot of reading on my own" (Susan)

"I can read fiction very easily, but not non-fiction" (Andrew)

"I really liked just like fiction, um, books, when I was younger, like in elementary, like upper elementary, like fourth, fifth, and sixth grade...I didn't really get into reading like nonfiction until like probably college" (Anita)

NR (no relevant content in the response)

Question 4: Change as a Reader

*Change***Positive**

"I remember hating reading when I was younger, like I said before, but now I love it"

(Cora) "Yeah, I've become a more careful reader" (Susan)

"Yeah, definitely... I think I've gotten a lot better" (Anita)

Negative

"Changed as a reader? Certainly. When you study literature, it, it's harder to enjoy it in the same way" (Benjamin)

"I think I've gotten a lot less focused" (George)

"I don't read as often as I remember having been a reader before" (Frances)

Stable

"I think I've stayed pretty much the same" (Hannah)

"I think pretty much the same" (Benjamin)

*Aspect***Reading Habits**

"I think it's, my reading has steadily broadened and increased since then" (David)

"in my free time, I have other things that I have to take care of, and it's not my first choice for entertainment. So, that has definitely changed" (Frances)

"I like different types of, I have a bigger or larger range of books that I like" (Cora)

"I would say my reading habits have probably stayed the same" (Andrew)

Attitude

"I've always really enjoyed reading" (Hannah)

"I've kind of like burdened my reading with a whole bunch of like expectation and, like, psychological drama" (Linda)

"I still really enjoy reading" (Regina)

Efficiency

"skim reading has become, like, easy, especially with science literature, something I'm doing for work, when I just need to know a couple of facts, I skim read" (George)

"I've gotten obviously like faster" (Anita)

"for classes and articles, I've learned to skim and read faster" (Jeffrey)

Effectiveness

"better able to, like, synthesize information, and like kind of get what the story is, or what the point is" (Anita)

"I tend to be a little more discerning and a little more deliberate, to try to make sure I don't miss anything, to catch, um, nuances, things that I want to consider in my own research, or in how I'm designing something" (Jeffrey)

"that's been a whole new process of reading for me, where I wasn't especially good at it right at the beginning, and I had to learn a way to approach it where I was getting it, and, and I'd never really had to read in that way, where I read, digest, - recognize what I didn't understand, read ahead to try to figure out, oh, that thing I didn't understand, it's up ahead, okay, now let me go back and reread it in the context of what I learned later, that you really have to chew on it in a much more methodical way and think really hard about the words" (Frederick)

Lens

"everything become so self-conscious, you're seeing, you're beneath the surface, and you can't just get in the flow of the emotion as much, maybe because you're, you're thinking too much" (Benjamin)

"I think my perspective on reading has been a little bit changed" (Lewis)

"it changed the way I thought to a certain extent, or the way I saw things" (Gloria)

Question 5, 6, 7: Current Leisure Reading Habits

Hours Daily

Less than 1

"Two or three hours a week, probably" (George)

"the rest is just, you know, whatever I can trickle in there" (Herbert)

"when I'm going through busy spurts in class or at work, I don't really get the time to"
(Hannah)

1

"Still read for an hour a night" (Andrew)

"every day I read the Writer's Almanac, at least, and so that's about, at least a 15 minute episode...And - other than that, maybe like forty-five minutes" (Carl)

"Maybe, like, an hour" (Edward)

More than 1

"I would say maybe like three hours a day" (Anita)

"maybe like, a couple hours a day" (David)

"that could be as high as four or more, four to six hours a day" (Frederick)

NR (no relevant content in the response)

Text Types

Fiction

"I read fiction." (Andrew)

"have a couple other books that are just more fiction, just reading. I'm trying to read through the Harry Potters" (Carl)

"I just read The Hunger Games trilogy, and that was, you know, a couple nights of, it's young adult science fiction" (Frederick)

"I need my novel, my fun book" (Emma)

Nonfiction

"I read cookbooks" (Frances)

"I still like reading nonfiction... I love reading, um, Malcolm Gladwell" (Edward)

"I've been reading more nonfiction, um, accounts of, you know, historical events" (Frederick)

Magazines and Newspapers

"I've gotten like People magazine for like a long time, so I usually, I will like, I won't read every article, but I'll read that" (Anita)

"I've got, try to read the New York Times every week" (Carl)

"I read magazines, I have a bunch of magazines that come to the house that are fiction, the Granta and the Paris Review, and then I also get Bride Magazine, and Science News. And I do read all of those" (Frances)

Religious or Self-Help

"I go to church, so there's a lot of, there's a lot of reading that's still in the Bible, so like, those texts as well" (Edward)

"I'm really into theology kind of like a hobby" (Jennifer)

"I read usually Bible every day, just one chapter or two chapters. But I also try to read the other secondary sources to interpret about the Bible" (Lewis)

"And sometimes I read, like, self-help books as well." (Cora)

Question 8, 9: Reading Interest and Importance

Enthusiasm

Very High

"I'm very interested in it" (Anita)

"tremendously. I mean, I enjoy the reading that I do... reading is, underlies almost everything that I spend, that I do, both in and out of my job" (Frederick)

"I love it. I think it's the best thing in the world" (Hannah)

High-Conditional

"I don't really think of it in terms of, I'm interested in reading just for the sake of reading, I think of it in terms of, how interested am I in a particular subject, and then if it's interesting or not" (David)

"Very, very interested, but, but it really depends on the material" (Deborah)

"Depends on what I'm reading" (Emma)

Moderate

"I'd think I've chosen a very poor career if I'm not interested in reading... I'd rank it lower than writing, ...it's a stage in a process, it's a means to an end, kind of" (Benjamin)

"As a graduate student, I'm like, yeah, I gotta read. it's just like, if I don't do it, like, if my mind shuts down, and I, I can't, I can't, like write" (Edward)

"I would, I would say fairly interested, yeah. Pretty, I would have to be, I think, to be able to survive" (Martha)

Low

"The process of reading is probably what I'm least interested in, because I, I tend to be, I get restless" (Carl)

Importance

Professional

"obviously for what I want to do with my life, like, it's very, very important to read, and, um, with like the research and with like, obviously, in academia, like, it's a really, really important thing" (Anita)

"With my degree I'm getting in science, I have to stay up on the latest research, I have to know who's doing anything similar to what I'm doing, I need to understand the theories and concepts to be able to interpret what I'm doing in my job" (Emma)

"It's very important now, because I'm in a, I'm a first-year graduate student, so if I don't read, I'm not gonna get that baseline of knowledge that is expected before moving on" (Jeffrey)

Personal-social

"it just struck me kind of, wow, it'd be nice that, if that was your default activity was you're just, you always have a book with you, you're always reading. That would be, just how much more, almost how much more interesting of a person you would be to talk to" (Carl)

"one of the reason I choose to teach read for kids is that I think reading can change young people's thinking" (Lewis)

Escape

"that's always been like an interesting part to me, is just like being able to kind of like escape a little bit" (Anita)

"it's absolutely necessary. I mean, that, just the ability to pick up a book and kind of escape into it" (Hannah)

"then reading at home it's, in bed, it's just a way for me to kind of get away and relax, and just drift off into another world. And so emotionally for me, um, and mentally as an escape, it's really important" (Emma)

Practical

"I think it's the best way to get information" (Andrew)

"every decision I make during the day is informed by, like, what I've read to make those decisions, so I would really argue that that's really the most important thing I do, because I don't really, I don't think I make any choices or decisions without doing some reading research on it" (Nora)

"For information" (Susan)

Self-Development

" I get a new lens. You know, it's just, I can't get that fresh perspective from doing other things" (Jennifer)

"in one sense, I give it the ultimate importance. I think it is the single biggest important thing in education or in intellectual development that there be a lot of reading, because it's the best way to gain vocabulary and learn language, and learn subtleties of language, subtleties of argument" (Frederick)

"I think you should keep it up every day, you know, as far as stimulating the mind and everything, but it's always, like, you know, challenging your vocabulary, and then, you know, adding to it also, or just, you know, making more sense of it, you know, like that, helping that" (Herbert)

Current Events

"I think it's important, um, in terms of like keeping up with just like, the news, and politics and what's going on in the world" (Anita)

"news, I mean, news to me is important, it's important, historically, what's happening now, how's it going to impact the future" (Jeffrey)

NR (no relevant content in the response)

Question 10: During Reading

Cross-over

Nonfiction

" when I'm in the zone, you know, it's not, it's not work. It's just, you're just flowing, you know" (Benjamin)

"I'm trying to think of an example but, a lot of, when I try to make myself read history, um, sometimes I get engrossed in it" (Frederick)

"there are times when I feel like I'm flying through a reading, when I'm really excited about the topic" (Deborah)

"it's a textbook, so it's like a lot of definitions, and walking you through the construction of different machines, and so that is very easy, and I find I'm reading it more like a pleasure book" (Frances)

Fiction

"if I'm reading, say, War and Peace, for example, it feels like, it feels like I'm actively doing something" (David)

"sometimes, like, back to novels, I'm really tempted to write notes. But I know I don't need to [laughs], it's not like I need to memorize something, but I think that's just something that I do, especially in books, like, I like to write notes in them" (Cora)

[are there variations, like for reading fiction versus reading a research article, or would you say you bring the same approach, all the time?] "Same approach, but different degree of work. Yeah, there's definitely times when - and, I don't read things that don't require that. You know, I don't read, uh, a book that would be like a tv show. I just don't even." (Jennifer)

NR (no relevant content in the response)

*Author***Presence of author, argument, conversation**

"a lot of times, you know, the, these art-, these articles are trying to, um, establish an argument" (David)

"I'm often thinking about the writer as they're writing this, why they wrote that, what are they doing" (Carl)

"Are they leaving out some important detail that might ruin their whole theory, or do I know a detail that changes their theory, or something like that" (Frances)

"everything the author describes, I want to make sure that I am visualizing" (Jennifer)

NR (no relevant content in the response)

Question 12: Nature of Good Reading

Efficiency/Understanding

"Someone who can process-, read quickly and accurately, uh, retain the information of the things that they've read" (Andrew)

"first of all, just to understand what the author is saying" (Anita)

"good readers are, are also able to say, like, I don't understand" (David)

"not needing a lot of time to grasp some concepts or, you know, reading something, um, and picking up on little nuances very quickly. Really, sort of being really efficient with their time" (Cora)

"the main thing for reading is understanding, um, so I think to be a good reader, you have to understand that the purpose of reading is to understand" (Nora)

Message

"you need to see what the text itself is doing, you don't want to bring, you don't want to just bring your own prejudices to it" (Benjamin)

"You recognize that reading is a, is - a tool to have a conversation with someone you'll never meet" (Carl)

"I think good readers sort of know that the text isn't just, it's not neutral, it's not static. It was meant for a certain - it was meant, it was written for a certain audience, and to try to figure out like, who this audience is, and how, how to respond" (Edward)

"Maybe to be able to take the perspective of the author and understand what they're trying to write, as opposed to pulling out facts or just reading it from your own perspective" (Jeffrey)

Attitude

"I think it means - being sort of fearless and confident" (Frances)

"I mean, part of me wants to say that you enjoy it. There's gotta be some kind of element of enjoying it" (Hannah)

"To enjoy it" (Linda)

Goal

"The second thing is if you can align your goal for reading a piece with what you take out of it" (Bonnie)

"good readers can reach their goals by their, through or by their reading" (Lewis)

"a lot of people can read, but if you're not using that reading, I don't really think that makes you a good reader" (Nora)

Reading Habits (Type/Amount)

"And so in that sense, you are stretching yourself as a person to read, and to read a variety of things" (Carl)

"So a good reader tries to find as much to read, as much as possible" (Carl)

"But I think if you are a casual reader or someone who just reads at home, I think to be a good reader in that sense, is just doing it, you know, doing it a lot" (George)

"someone, probably just, I mean, if you tend to read a lot, then you, uh, your, you, you know, practice [laughs]. Practice tends to help" (Martha)

Decoding

"if they're familiar with the form, and then they're able to decode successfully enough that they don't have to exert a lot of effort in that" (Martha)

"there's lots of things that you have to do to understand, and those things include like, looking at small chunks of words to help you figure out the big word, thinking about what you already know, or words that might make sense" (Nora)

Question 13, 14: Self-Description as a Reader

Self-Evaluation

High: [a coding of High could be in relation to a directly stated self-evaluation or also a self-description that focused primarily on strengths]

"in terms of percentile, I'd say I'm above average" (George)

"I am a good reader" (Frances)

Moderate: [a coding of Moderate could be in relation to a directly stated self-evaluation or also a self-description that was neither strong nor weak, or a balance of both]

"I am a fairly good reader" (Anita)

"I'm a good reader at, like, graduate work, but I'm sure there are better readers, you know, like, but maybe if I read like, the Washington Post, I'm a good reader, so, I think for me, it depends on what I'm reading" (Edward)

"I think I'm an okay reader" (Martha)

Low: [a coding of Low could be in relation to a directly stated self-evaluation or also a self-description that focused primarily on weaknesses]

"Not particularly good" (Andrew)

"Yeah, a lazy reader" (Carl)

"I don't know if I can say that I'm an average reader or a bad reader or a good reader. But I, what I can say is that I have certain deficits" (David)

*Strengths***Reading Habits - Breadth of Reading or Capacity**

"I like different types of, I have a bigger or larger range of books that I like" (Cora)

"if it's in a book I can read it and get it" (Frederick)

"if I take the time and I slow down, and I don't just skim read, I feel I can interpret anything I want to" (George)

Reading Habits - Amount

"I read a lot more than a lot of other people" (Anita)

Reading Habits - Attitude

" I love to read" (Anita)

"I feel very confident, that gives me confidence in a lot of different ways, which is that nothing is really beyond my understanding" (Frederick)

"I think I have a good attitude about it" (Deborah)

"I am fearless" (Frances)

Process - Speed

"I'm a pretty fast reader" (Anita)

"I can read things fairly fast" (Edward)

Process - Attention/Focus

"I'm good at focusing when I read. And, attentive" (Benjamin)

"I'm a little bit more patient than some of my other friends who might not have time to read a six-page, you know, news article in the New Yorker or like Times or whatever" (Cora)

"when it comes to, like, interpreting a book like emotionally or mentally, like, especially fantasy books, I can get really involved, and I stop seeing the words"

(George)

Process - Vocabulary/Language

"going back to what I was saying about enjoying the words themselves, and enjoying, like, where they come from. I think for me that's a strength" (Deborah)

"I think I'm also good at being aware of how the use of language is affecting my, you know, perception of the events that are being described or the argumentation that's taking place" (Linda)

Purpose - Details

"strength in reading? Um, I sometimes attend to minute details" (Bonnie)

Purpose - Understanding/Big Picture

"I find it fairly easy to grasp general concepts from text" (Andrew)

"I know that what I do read I understand" (Carl)

"I think I do - a good job in most cases of, certainly of understanding ideas, themes, what - getting the intent" (Frederick)

Purpose - Use/Evaluation

"being able to read critically...very, a lot" (Carl)

"the strong thing that I'm able to do now is being able to link whatever I read to prior, prior things before, and use them for what I need" (Edward)

"if you give me the textbook, I can teach it. If you give me the book on how to do it, I can get it and do it, so, so I feel like my ability to get to a point of mastery of a topic is very powerful, I feel like my ability to get to a point of mastery of a topic is very

powerful" (Frederick) "Strengths, I think I'm decent at synthesizing information, and I think that's one of the reasons I went into science is, having that ability" (Emma)

Stance - Self-Awareness

"having that awareness of what helps me to read has made me a better reader in that regard" (David)

"I think that I'm pretty good at, um, knowing like how much, how carefully I need to read" (Anita)

"I'm more metacognitive I would say, about, about the reading process now than I was before" (Bonnie)

Stance - Openness

"I try to understand, you know, and to, uh, get the point, get the feeling, and try to be sympathetic" (Benjamin)

"I'm kind of open-minded about, um, just learning, like different types of things when I'm reading" (Cora)

Weaknesses

Reading Habits - Breadth of Reading or Capacity

"I, I wish I had broader literary taste" (Linda)

"But a weakness would be, like, I'm not, maybe not a hundred percent confident if I'm reading something different than what I'm usually reading" (Nora)

Reading Habits - Amount

"I should read a lot more than I do" (Carl)

"I'm not the bookworm" (Lewis)

Reading Habits - Attitude

"I feel badly that I still have what I would consider a grade-schooler's attitude toward certain types of texts, that I look at them and sort of dread them, and, yeah, I'm in a homework, you know, an ew, homework frame of mind" (Frederick)

"right now I would classify myself as a, like a directed, I'm reading what I need to read because of requirements... It's not enjoyable reading" (Jeffrey)

"I don't, the weakness I feel like I have there, is I don't really know what other people are thinking, so I don't know if what I'm thinking, I'm not conf-, I'm not always confident" (Edward)

Process - Speed

"in graduate school I kind of worked out that I could read about thirty pages of non-fiction in an hour. That's, ridiculously slow" (Andrew)

"I also kind of think that I'm a very slow reader. I don't really know if that's still true, I mean, I haven't like done any tests of that in comparison with other people, but I just feel like I, I'm a slow reader" (David)

"sometimes I think I read, I still read maybe too quickly" (Edward)

Process - Attention/Focus

"I'll go through like a page and then I'll, I'll come to the realization that, you know, I just wasn't even paying attention, and then I'll have to go back and reread it, you know" (David)

"I get distracted pretty easily, usually" (Bonnie)

Process - Vocabulary/Language

"my vocabulary is not that great" (Emma)

"that is actually where I am the worst at reading, I would say, is understanding sentence, I do not understand English, I don't understand what a predicate is, or a subject, or how they're interrelated" (George)

Purpose - Details

"I miss details by being, by biting off pieces that are so big" (Frederick)

Purpose - Understanding/Big Picture

"I mean I still, like, struggle with some of the more challenging readings, like, for school, um, like some of the readings will, about like different theories and stuff like - it'll be hard for me to really understand kind of what their, like what their theory is, and I don't know if that's my, if that's like just me not, like, getting the main points. I definitely, I definitely still am not completely there yet in terms of like, I can't just like pick up any-, absolutely anything and like understand it." (Anita)

"I don't always understand or grasp concepts the first time I read them" (Cora)

"even though I'm a good reader, I feel like, I even lack a little bit of comprehension skill" (Jennifer)

Purpose - Use/Evaluation

"I do often lack that attention, in, in that, that, um, remembering to like, to actually make that judgment at the end" (David)

"that's where I still struggle, trying to figure out the importance of the reading"
(Edward)

Stance - Self-Awareness: [no one mentioned this as a weakness]

Stance - Openness

"I have pretty strong and pronounced, you know, values or opinions or something, and I could maybe be tempted to read stuff through the lens of, you know, the philosophical framework that I care about the most at the time" (Benjamin)

"I wish I was better at getting more enjoyment out of more different kinds of wr-, of writing than I think I am" (Linda)

Question 16: Approach to Reading

Situation-Dependency

General

"I think, that it tends to be, yeah, my default mode" (Benjamin)

"I always try to keep a positive attitude about it" (Deborah)

"No, I mean, just, being open, being open-minded" (Cora)

"I don't usually have a particular frame of mind when I pick something up to read it" (Frances)

Depends

"I think when I'm reading fiction I approach it in a positive, enjoyable manner, and when it's non-fiction, particularly if it's for my dissertation, I tend to see it as work that has to be done" (Andrew)

"sometimes I, I'm just like so much, like, I just want to stop now and just read this, like, I want to stop every-, like, okay, because I'm so motivated to know what this person has written about it, so I, I'm coming to that reading with really a lot of expectation and motivation. Other times it's like, man, do we really have to read this" (Bonnie)

"Um, it depends on the reading" (Edward)

*Aspect***Enjoyment**

"I approach it in a positive, enjoyable manner" (Andrew)

"I'm always, oh, this is awesome, I love reading that" (Edward)

"I love reading, so, when I'm do-, reading something that I just wanna read, I mean, that's kind of the way I'm going into it. I've obviously picked out this book because it's something I'm interested in, and so I'm excited about it" (Hannah)

"if it's dry and boring, and I read it, I'm like, ugh" (Edward)

Effort or Obligation

"I tend to see it as work that has to be done" (Andrew)

"Sometimes I approach it with just a feeling of obligation" (Carl)

"like anything, like, you know, it's a chore, so you've got to sort of take it on like a chore" (Edward)

"You know, like, I've got to, I've got to sit down. I know once I get into a book, I'll get all the way into it. But sometimes it's kind of like going for a workout" (Jennifer)

Evaluation

"the attitude that, not that I always have it, but that I would like to have, is to be able to come out of it with a certain, with having made a judgment on what I'm reading" (David)

"even if it's required, well, there's a reason for it, let me figure out what the reason is, so you know, you kind of motivate yourself to figure out what's important behind this and how it fits into everything else that you're studying" (Jeffrey)

Learning

"I think, to learn, to grow, you know" (Benjamin)

"I definitely always try to figure out, well, what can I learn from this" (Cora)

"there was a certain way in which I would say, like, well, here we go. Like, - um, what do you have for me" (Gloria)

Question 17: Goals

School/Work

Understand

"if it's an article or something I'm required to read, if I can stop at the end and say, okay, I under-, I think I understand what the point of it was and what their conclusions were, I think I could summarize the main points, to me, that's successful" (Jeffrey)

"when it comes to information text type of reading, I definitely try to figure out, you know, what I'm, what are they trying to tell me" (Cora)

"if I can kind of summarize what I have read, then I feel like, that I've done a good job reading it" (Hannah)

Analyze

"And what it is they're not saying. Like, why they didn't include this, why they didn't include that" (Carl)

"Some other time, well, no, you pin down, these are the two most influential readings about this area. And so you want to dissect them" (Bonnie)

"you think, what is this, and usually it's like somebody's master's projects, it's a lot of, years of work have gone into it, and so it's usually worth it, to sit there and unpack it"

(Frances)

Escape/Involvement: [there were no responses coded for this]

Learn/Judge

"I was really just like immersing myself in, trying to sort of like get inside of this, the shape that reality had for this man, so that I could see it, and start to understand how he thinks" (Gloria)

Share

"But with papers, it's a lot harder, so it's nice to be able to do the presentations"

(Frances)

"And then, and then if I can describe it to someone else, that's the best, and I can do a presentation, and be like, oh, this is, this is what I learned. And then everyone's like, yeah, that's how it works, and you go, yes. So, I must know what's going on, because I was able to describe it to these people, and they understand it" (George)

"So, bring up something in class, so" (Martha)

Answer Questions

"the second part of the thing would be, when I'm sitting down with a precise article, right, or a precise thing where the question is, really, like, I need to understand this particular question more... an example like that, there's such a precise aim, in going to find that source, it's really like, really, what are the problematic nuances to this particular approach. And you know what, actually, reading is, reading something like

that is in a certain sense much quicker. It's really just like, okay, let's see what this guy has to say about it. Ah! Yeah. Okay. Got it" (Gloria)

Leisure

Understand: [there were no responses coded for this]

Analyze: [only one participant, Anita, coded for this - taken from notes - for her, a critical stance toward text also emerges when reading online]

Escape/Involvement

"you know, back to my middle school glory days, you know, it was just, just to get away, just to get, get involved and just for the pure joy of it" (Benjamin)

"if I'm reading a novel, it's just for fun, to relax" (Cora)

"But then when it comes to a story or a book, it's, you just want to listen, you want to read a good story" (Herbert)

Learn/Judge

"I aim, I aim to absorb, absorb what is written, and immediately reflect, and see, how does that affect me" (Carl)

"even when I'm reading for entertainment, I want to know what's going on, I feel like there's always something behind the story, it's not just for plot, or, like, pure entertainment, or, that's the wrong word, that's too, too vague, but I like there to be something else to it... there's something more about, like, man's condition that's behind it, and that I like to think about" (Frances)

Share

"or, if it's [laughs] to tell my fiancé he really needs to eat more raw foods to prevent cancer, you know, like that kind of thing" (Nora)

Answer Questions

"sometimes I'm reading to try and find explanations for things, like, I read a lot of medical stuff now" (Frances)

*General***Understand**

"Mostly at comprehension, I would say" (Frances)

Analyze

"I think, part of the aim would be to, like, make sure that I'm gathering the information in a good way, ... if I read something I want to be sure, not necessarily to become an expert on something, but that I have enough information and enough sources that are credible" (Nora)

Escape/Involvement: [there were no responses coded for this]

Learn/Judge

"Yeah, I think the learning, the growth thing" (Benjamin)

"the attitude that, not that I always have it, but that I would like to have, is to be able to come out of it with a certain, with having made a judgment on what I'm reading"
(Carl)

Share

"I like to be able to tell what I've read to somebody else, even if they don't care"
(Frances)

"I guess another aim would be, you know, if I'm reading something, um, and I'm looking for information, I'm hoping to be able to then share that information with somebody else" (Nora)

Answer Questions

"I usually have a question or am looking for some specific thing" (Nora)

Appendix M: Examples of Codings for Knowledge Pre-Assessment

Responses getting a point:

[These responses gave enough information to be able to tell that the participant knew something about the given topic, even if it was not something that appeared in the passage to be read. It needed to be appropriate, reasonably specific, and accurate (where this applied).]

- First sacrifice in Christianity made by Cain and Abel [*Sacrifice* - Pamela]
- Fallacies [*Logic* - Hannah]
- The many uses of "needle," including sewing, puncturing, and possibly injecting [*Needle* - Linda]
- Discussion of the morphology/function of the spinnerette that forms the silk [*Silk* - Deborah]
- Compare and contrast the rights of parents to other family members taking part in a child's upbringing [*Minors* - Deborah]
- Children are akin to wild animals, don't have language, morality, self-preservation [*Parental Duty* - Frederick]
- Different types of perspectives / angles from which to paint [*Painting* - Cora]
- The uses of beauty as a description of how people relate to things they consider to be good [*Beauty* - Linda]
- They will most likely discuss the roles of phloem and xylem (vascular tissue) and what they transport from soil and what the plant makes itself. [*Food of Plants* - Herbert]
- Critical/sensitive period for language learning/accents [*Language* - Anita]

Responses not getting a point:

[These responses were too generalized, repeated information presented in the prompt material, were inaccurate, inappropriate for the topic, or restated one of the other points already made. In particular, if I could just as well substitute some other word for the salient word, then what was said was not adequately specific.]

- The 3 religions of pagan mythology [*Mythology* - Regina]
- Description of the process of using an oven to incubate eggs, including what is entailed in the "management of an oven" [*Hatching* - Jeffrey]
- Further description of how silk made [*Silk* - Nora]
- Details about how the law applies to non-related "tutors and curators" [*Minors* - Deborah]
- Types and purposes of painting [*Painting* - Cora]
- How marriage has changed over time [*Marriage* - Andrew]
- Current applications of algebra [*Algebra* - Jennifer]
- Why language is so important and necessary to human beings [*Language* - Anita]
- How fire is made [*Fire* - Nora]
- Where potatoes grow best (under what conditions) [*Potato* - Cora]

Appendix N - Codes for Think-Alouds

Text Meaning - Behaviors or thoughts related to the mechanics of deriving meaning from the presented text

- **Re-reading**

[either directly rereading a portion of the text (which would be given in italics) or stating that rereading has happened/is happening, but without actually verbalizing the text again]

"I have to reread this sentence in the second paragraph." (Pamela)

"but we do not suppose in algebra that plus a equals minus a." (Frances)

- **Reading on**

[declaring the intention to move on, although perhaps without complete understanding of what has just been read, often following statement of non-comprehension]

"I'm gonna keep on reading." (Nora)

"I'll read on." (Susan)

- **Looking ahead**

[looking ahead in the text to see what's coming, or to find an expected text element]

"Okay, so we've got, I see in the next paragraph, it starts, the second religion was that of paganism." (Jennifer)

"And then I need to look where the second kind is, now, before I continue." (Bonnie)

- **Changing rate**

[reading more rapidly or more slowly - will be indicated typically by annotation in the transcription]

"[reading rapidly]"

"[reading slowly]"

"I'm reading this again, slower." (Anita)

- **Guessing the meaning of a word in context**

[offering a provisional interpretation at the word level of the meaning of a word as it is being used in this situation]

"I guess the grain is in weaving, when you are weaving a cloth?" (Frederick)

"I guess it means, um, appearing at the same time." (Pamela)

- **Predicting**

[guessing about what will be coming up in the text not yet read]

"This should be about silk." (Frederick)

"this will outline what makes someone a painter." (Susan)

"It looks like it's gearing up for a contrast." (Gloria)

- **Questioning**

[either direct, that is, in the form of a question, or indirect, as in wondering about something; does not always correspond to the appearance of a question mark, which was transcribed as indicating an upturn in the voice typically associated with a question]

"I just wonder what the difference is between universal arithmetic and common arithmetic." (Gloria)

"Where, what is the grain?" (Benjamin)

"So I wonder if they're talking about the same thing." (Edward)

- **Marking or annotating**

[stating that one is making some kind of mark on the paper, including circling, highlighting, writing notes, numbering, drawing a diagram, underlining, making a question mark or asterisk, and so on]

"Okay, I'm writing that down, to keep track of..." (Nora)

"Underlining." (Regina)

"I'm gonna highlight this." (Edward)

- **Using text element**

[referring to a text feature or element such as title, reference, subheading, italicization, capitalization, organizational device in order to draw a conclusion or support an interpretation or otherwise work at meaning derivation]

"Okay, so now I'm on to number two." (Jennifer)

"that this guy right he-, the person writing this, and let me look back at the front, it's the same author." (Edward)

- **Using dictionary**

[thinking about or actually consulting a dictionary]

"[looking up word]" (Jennifer)

"I might search in the dictionary if I had access to it." (Bonnie)

- **Restating (paraphrase) or repeating text information**

[saying in one's own words or otherwise repeating what has been stated in the text, but not directly rereading the text; this differs from an interpretation in that what is being stated is essentially a re-presentation of what has appeared in the text, with no additional inferences or hypotheses involved; can be either accurate or inaccurate]

- local (word, phrase, sentence level)

[restating on a small and immediate scale what the text has presented, generally not offering an overarching restatement across more than one or two sentences]

"It says that a minus a equals zero." (Frances)

"Telescopes help us discover stars we couldn't see with the naked eye. And the better our telescopes are, we can see more stars." (Susan)

- global (paragraph, passage level)

[restating at a gist level, giving the main idea expressed by several sentences, an entire paragraph, or the passage as a whole]

"Okay, so parents have to help their children, support their children, be good role models, but they should only go so far." (Pamela)

"Okay, so this is kind of telling me about how to choose the silk, or what to buy of the thread, um." (Nora)

"Okay, so it's saying that there is representation in geometry that's abstract, but in algebra it's even more abstract." (Jennifer)

- **Connecting to background knowledge**

[noting that one does or does not know something in connection with what the text is presenting; connecting what the text is saying to what one knows already]

"what is the cod, I don't know." (Lewis)

"All right, something I know about." (Carl)

"This reminds me of what I just read, um, about virgin births, um, in a book I read by Joseph Campbell, talking about what the virgin birth really means, it's like a spiritual rebirth." (Jennifer)

"First of all, potatoes, I thought, were poisonous." (Frances)

- **Visualizing**

[attempting to form or forming an image of what is being described or discussed in the text]

"So I see a little morning star, and a horizon. It's like a planetarium." (Linda)

"I'm just imagining something like Christmas ornaments on - " (David)

"so I sort of see this murky picture in my mind, like the water's not very clear, it's very, like, um, murky, I guess, not really like translucent." (Edward)

- **Connecting to prior text**

[linking to text read earlier in the passage; typically not reference to prior passages read, which would be coded as connection to task]

"but they just said up there that it requires a double or triple force of gravity." (Anita)

"which, I guess by the previous argument is because he's usually bigger and stronger." (Frederick)

"so that word fermented again comes up." (Edward)

- **Interpreting/hypothesizing (a statement building upon what directly said in the text)**

[stating one's understanding of what the text is saying in a way that includes additional inferences or the use of one's own knowledge, so extending beyond what is directly present in the text; can be either accurate or inaccurate]

"So even though he talked about both parents combining their joint wisdom, it sounds like not much is coming from the mother." (Pamela)

"He's talking about money." (Linda)

"so, trying to make sure that it's all the, that the mixture is good to go." (Edward)

"I think it has something to do with painting people, in scenes." (Susan)

- **Elaborating (a statement moving away from what is directly said in the text)**

[stating an idea that is not directly connected to what the text is presenting, and not necessarily directly related to deriving an understanding of the text; so sometimes more like stream-of-consciousness association, but sometimes just pursuit of a thread or an idea a few steps away from the flow of the text]

"A point is that which has no part." (Frances)

"our sunglasses" (Carl)

"So maybe that's why they, I'm looking at the post, and it reminds me of the Washington Post, or some sort of newspaper, and maybe that's why they call it a post, because of this method of making paper." (Edward)

- **Evaluating comprehension (positive or negative)**

[considering whether one does or does not understand the meaning of the text; sometimes requires consideration of context to see whether the response is about comprehension, agreement, or background knowledge; in general, can be distinguished from connection to background knowledge by the inclusion of some reference to sense, meaning, or understanding]

"Everything makes sense so far." (positive) (Frances)

"Okay, I get that." (positive) (Susan)

"I don't know what it means by same." (negative) (Frances)

"I don't really know what that means, affections of quantities." (negative) (Linda)

"I don't understand what a free waterway is." (negative) (David)

- **Re-considering interpretation**

[checking on or revising an interpretation of the text's meaning]

"Oh, I guess it's saying that plus a equals plus a ." (Frances)

"That's probably what it means." (Benjamin)

"aha, I thought that might be what they were getting at." (Jennifer)

Text Characteristics - Behaviors or thoughts related to characteristics of the text as a piece of writing

- **Noting text feature**

[mentioning a feature of the text, such as an unusual spelling, an italicization, the use of punctuation]

"So that's weird, I keep seeing that, they say s-h-e-w-s, instead of shows." (Anita)

"Oh, I think it's a typo." (Carl)

"An entry with no subheadings." (Frederick)

- **Noting text structure**

[mentioning how the text is organized, such as noting a parallel construction, the order of presentation of topics; does not include evaluation or use of this in understanding what the text is saying]

"so now they've gone, and they've just, the article has just moved from the family to society." (Gloria)

"and then, again, the summary at the end." (Jeffrey)

"he seemed to be making a distinction." (Gloria)

- **Evaluating text quality (positive or negative)**

[criticizing or praising some aspect of the text as a piece of writing, such as clarity, complexity, length, comprehensibility; important to distinguish from evaluation of the text as presenting an argument - evaluation of text quality for this coding does not address persuasiveness, credibility, evidence, or argument flow]

"That is an incredibly long sentence." (negative) (Frederick)

"That's a weird example." (negative) (Anita)

"A clunky way of saying multiplication." (negative) (Benjamin)

"it's got kind of a cute way of describing the silkworm." (positive) (Deborah)

"Okay, using former and latter is not too bad, 'cause they keep using it in the same way, and you get used to it." (positive) (Frederick)

"it's a good description." (positive) (Susan)

Text Message - Behaviors or thoughts related to the text as a message from an author to an audience or to oneself

- **Arguing with the text**

[raising objections or counter-arguments to what is being presented in the text]

"It seems like they think they're defining something, but if you just say increased by addition, that's, um, sort of tautologous." (Frances)

"It seems to me like some of those parts are not necessary for all bridges, like, I don't think of, I don't think the footway on each side is a necessary component of a bridge, so, it seems like that's sort of an optional component." (David)

- **Evaluating agreement with text (positive or negative)**

[determining or considering whether one agrees or disagrees with the truth or accuracy of what is being stated in the text; sometimes requires consideration of context to distinguish from evaluation of comprehension]

"I'm dubious about that." (negative) (Frederick)

"So I think that the author is mostly right." (positive) (Jennifer)

- **Evaluating importance (positive or negative)**

[determining or considering whether a portion of the text contributes to the message or argument]

"That does not seem important." (negative) (Frederick)

"It would be - useful to know that." (positive) (Andrew)

"I think that all of the things in it were good important details." (positive) (Frederick)

"Who cares that it has 11 rings." (negative) (Frederick)

- **Evaluating the argument (positive or negative)**

[determining or considering the strength, credibility, persuasiveness, organization, flow, or other aspect of the argument or line of reasoning being presented; may take into account evidentiary value]

"But I guess if their main point is the infant baptism, then that makes sense."

(positive) (Frances)

"I suppose if the Bible's the source of truth, understanding what it actually said in its context makes sense." (positive) (Frances)

"I'm not finding any real facts here yet." (negative) (Susan)

"I'm still not sure how we got to this charming and beautiful." (negative) (Susan)

- **Considering author intent**

[reflecting upon or judging what the author is aiming at (intentionally or unintentionally, as in biases or assumptions) in writing this text]

"So this does not seem like information for the general encyclopedia reader, this seems like information that would only really be meaningful to someone who already knows how to spin and weave silk." (Frederick)

"Maybe a little bit of British bias here." (David)

- **Considering own intent**

[reflecting upon or judging one's own intent (including expectations, biases, preconceptions, or assumptions) in reading this text]

"A little less historical in scope than I was expecting." (Benjamin)

"I'm finding myself less able to separate what I'm reading from where and when I know its context are." (Gloria)

"I'm reading it as though I were going to start growing potatoes myself, and I'm seeing whether it makes sense." (Frances)

- **Connecting to personal experience**

[linking what is being said in the text to one's own past, present, or future experience; distinct from connection to prior knowledge in that direct reference is made to one's own body of experience rather than what one knows about from reading or instruction]

"I'm already just thinking of eighth grade math." (Gloria)

"I'm thinking about how I would be able to explain my thinking even better after I, after reading this." (Jennifer)

"I'm getting married in a year, so this is something quite common in my life right now." (Andrew)

- **Connecting to the context**

[considering how what is being said in the text is connected to contextual aspects such as the type of text, the timeframe when it was written, the audience for whom it was written, or the timeframe in which one is reading it]

"and again I go back to thinking about where it's, where it's being, where it was read, and I wonder if algebra was not very widely known." (Gloria)

"I can tell this is from a very old passage, the way they're talking about children, he's talk-, he or she is talking about children." (Pamela)

"I guess that's sort of how we feel today, about needing prescriptions from doctors."
(Gloria)

Task - Behaviors or thoughts related to the task

- **Connecting to task**

[linking what one is thinking or doing to aspects of the task, such as the prior knowledge assessment, the selection of the passage, or the activity of reading and thinking aloud]

"Hm, I was right about the Romans being the first, predicting that they would say something about the Romans." (David)

"I hope I'm talking loud enough?" (Susan)

"I'm not being evaluated." (Jennifer)

- **Evaluating task completion (positive or negative)**

[noting how far one is toward completion of the task]

"I'm now going to look at the next page to see, oh, boy, I have a lot more to go through." (negative) (Susan)

- **Evaluating task difficulty (positive = greater difficulty or negative = less difficulty)**

[noting the difficulty or ease of the given task in the given situation]

"I'm not sure how much of this is being distracted, and how much is, this is just really hard for me, material." (positive) (Susan)

"the reason why reading this passage is a bit, more difficult than I would usually think." (positive) (Edward)

"This is one and a half pages." (positive) (Lewis)

Affect/Motivation - Expressions or evaluations of affective or motivational response

- **Interest (positive or negative)**

[Expressing positive or negative interest in any aspect of the text or situation]

"An interesting idea, that children come out with little knowledge, because if they came out with knowledge, they wouldn't listen to their parents." (positive) (Pamela)

"Hardened by the air, interesting." (positive) (Lewis)

"That is an interesting example." (positive) (Anita)

"I'm bored by the knowledge that, uh, there are 11 rings on the silkworm." (negative) (Frederick)

- **Curiosity**

[Expressing curiosity about what has been or will be addressed or stated in the text]

"I'm curious to see" (Jennifer)

"I want to know why this person thinks it's not necessary." (Linda)

- **Surprise**

[Expressing surprise about something stated (or not stated) in the text]

"I'm like, wow, a lot." (Edward)

"whoa- " (Regina)

"I'm surprised to read that here." (Gloria)

- **Attention (positive or negative)**

[Evaluating one's own level of attention, care, or distraction while reading; almost always negative]

"I'm a little distracted here, but okay. ... I'm still distracted 'cause I can hear voices in the hallway." (negative) (Susan)

"I'm not doing as careful a reading as I did the first two times." (negative) (Jennifer)

"I'm kind of just scanning through the text." (Pamela)

- **Amusement**

[Laughing, saying something is funny, or otherwise expressing amusement]

"[laughing]"

"Too strong or too stubborn, this is so funny." (Bonnie)

- **Liking/happiness (positive or negative)**

[Expressing liking, happiness, or other positive response or its opposite, in relation to the text or situation]

"I hate this." (negative) (Frances)

"I like to do this." (positive) (Jennifer)

"I like the feeling of the second paragraph." (positive) (Deborah)

- **Empathy**

[Identifying with the situation of someone discussed in the text, but without reference to one's own personal experience]

"So, at this point, I'm still, I'm kind of sad, reading this, because like, um, this is all about, like, 'cause children were sort of like written in the same passage as masters over servants, vagrants and sturdy beggars." (Edward)

"Oh, god, being a needlemaker probably sucked. You'd get all hot and greasy."
(Linda)

Appendix O: Codes and Examples for Outcomes for Q2 Learning

- **Things in the text**

(responses indicating that what was learned was what was presented in the text, including any of the following)

Specific facts or propositions

"I did, however, learn that a lemon grafted to an orange tree will mature as a pure lemon." (*Food of Plants* - Jeffrey)

"Abridgement is the act of reducing a lengthy text or lecture into the main points (or could be described as a summary)." (*Abridgement* - Nora)

"The strongest arches are those shaped like a perfect half circle." (*Bridge* - Jennifer)

Conclusions

"Hand-raising potatoes (without any machinery) is a lot of work, requiring at least two horses and eight or nine people." (*Potatoes* - Frances)

"even gases are affected by gravity" (*Mechanics* - Pamela)

Summaries - lists or overviews

"Different types of liquids are affected by cold or frozen in different ways. Different types of solids are also affected by freezing temperatures. Frost generally starts with the surface of a liquid or solid and then moves downward, and the depth of the frost depends on many factors, such as how long the frost occurred, the substance affected, etc. Water animal life, during these cold temperatures, often move to the deeper parts of the water, where there is no frost, in order to survive. Frost, depending on severity, can also cause death among humans." (*Frost* - Bonnie)

"5 rules to judging the goodness of paintings"

subject matter

expression of characteristics / things in painting must be natural and obvious

lighting (one focal, all other supplement)

drawing should be logical and characters be proportional

colors should be natural, clean, pleasing to the eye

Paintings can have natural foundation, but can also be elevated by showing the rare scenes or imagined beauty through the painter's perspective

There are different types of medium that can be used in painting, and each one have different techniques and consequences. Oil paints have bolder colors, but doesn't dry fast, so can retouch more easily. Fresco dries fast.

grinding true color to oil is important in oil painting

don't mix wet & dry oil paints

purest & strongest colors should appear in the forefront of the piece" (*Painting - Cora*)

"It gives a very basic introduction to numbers understood as conceptual (abstract) indications of quantity and the relation between positivity and negativity." (*Algebra - Gloria*)

"1 Why it's hard to build bridges

2 Bridge parts

3 requirements of building a bridge over water, especially w/r/t laying the piers in water (e.g., important requirements for setting the foundation and breaking the current)

4 4 conditions of bridges, + how ancient (Trajan on Danube) + modern (Westminster) meet these conditions

5 Building materials used for bridges" (*Bridges* - Regina)

"There exist three camps that interpret religion differently. The philosophers who look for "true" god that is a god who exists without a formal religion or east. Next is the pagans who believe in the mystic and perform rituals that are passed down. And finally the idolaters who are the 'common' people. This final group only worship or fear things that affect them and do not keep a consistent theology but instead are extravagant and self serving." (*Mythology* - George)

- **Things from (interaction with) the text**

(responses indicating that what was learned was a consequence of one's interaction with the text, including any of the following)

New idea, distinction, way of thinking

"I learned about a way of conceiving "positive" and "negative" as descriptions of an affect that one quantity can have on another." (*Algebra* - Linda)

"It has become apparent that a standardized system of symbols for basic mathematical operations didn't just always exist but had to be invented (something I had not thought of before)." (*Algebra* - Benjamin)

Connection to own ideas

"Baptism is considered a spiritual birth in the bible & also according to the Anabaptists, which makes sense - why would babies need to be reborn already?"

(*Anabaptists* - Jennifer)

"I'm not convinced about their notion of relative beauty, especially in relation to an object's utility." (*Beauty* - David)

Connection to personal experience

"I want to remember this for future classroom demonstrations." (*Mechanics* - Frederick)

"I have always wanted to produce beautiful art and have never been able to. Therefore, I learned from this entry the materials used make all the difference. I may want to try oil. I found it beautiful how they spoke of making all subjects beautiful. I always try to make all my drawing to fit what I see in front of me rather than how I want to see them." (*Painting* - Emma)

- **Things about the text/author**

(responses indicating that what was learned concerned how the text was written or what the author was intending, including any of the following)

Bias

[indicating that what was learned relates to awareness of the presence of bias or its effects]

"The most important thing I learned from this passage is that people who write articles are often skewed by their own perceptions and will present information in a manner to promote their own argument." (*Food of Plants* - Jeffrey)

"I learned about a predisposition to conceive of beauty as something that reflects the particular dignity and importance of human beings. I learned that if you are predisposed to want beauty to be directly related to a particular range of things that

you find beautiful, your discussion will not be very helpful to anyone else." (*Beauty* - Linda)

Author opinions, ideas, intentions, concerns, assumptions (and what they are)

"As a result of abridging text, the author suggests that one's understanding will improve, and keeping these summary notes are a good reminder of what was read."

(*Abridgement* - Nora)

"It is very important to Smellie (ed.), or to the Anabaptists who submitted the text, that they are an obedient, law-abiding people, and their views on baptism and religion don't interfere with their role as citizens." (*Anabaptists* - Frances)

Critique of text

"It was interesting to see how much thought went into this passage, when I felt that the kernel of the message could be (and should be?) summarized in a very few words." (*Grammar* - Deborah)

"This entry provided a lot of detail about how potatoes should be grown and managed. It was detail-rich and definition-poor." (*Potatoes* - Frederick)

- **Things about the context**

(responses indicating that what was learned was about the historical context in which the text was written, including any of the following)

Comparisons between then and now, us and them

"From a modern perspective, the topic seems trite & over-explained." (*Grammar* - Deborah)

"We have progressed a lot in our understanding of plant biology since this passage was written." (*Food of Plants* - Emma)

How things were then

"There was a debate at this time about what plants ate + whether it was the same for all the different plants." (*Food of Plants* - Andrew)

"at the time of this publication, Neptune and Pluto had not been discovered."

(*Astronomy* - Carl)

Appendix P: Codes and Examples for Outcomes for Q3 - Reliability

- **Consideration of level of agreement with the text**

(evaluations of reliability as related to consideration of one's agreement with the text, reliance on one's own prior knowledge or experience to determine the veracity or accuracy of what was claimed or presented in the text, or reference to one's level of doubt or certainty)

"The information seems fairly reliable and does seem to make sense as a process."

(*Logic* - Hannah)

"I imagine Greek and Roman sacrifices were quite different." (*Sacrifice* - Pamela)

"It's all 100% accurate - I know this because I am totally familiar with the basics of algebra." (*Algebra* - Jennifer)

"Because I did not have much background knowledge on this topic, it is hard for me to judge the reliability of this entry." (*Silk* - Martha)

"I cannot help but take everything he/she is saying with a grain of salt." (*Medicine* - Anita)

"There is no apparent reason to doubt the rest of it." (*Hatching* - Carl)

- **Quality of the argument**

(Evaluations of reliability related to reference to the text as presenting an argument, including: the structure of the argument presented; the nature and appropriateness of the support offered or desired, such as sources, citations, numbers, anecdotes, examples, author credentials; the level of detail included; the completeness of coverage of the topic.)

"I question the reliability of the info presented because of the second to last paragraph that seemed out of place." (*Potatoes* - Cora)

"[I] really liked how the author(s) broke down our need to communicate into very simple rules." (*Grammar* - Emma)

"I would say this entry is fairly reliable, it seems to be based on fact rather than anecdotal evidence." (*Algebra* - Anita)

"I am doubtful about the author's level of knowledge about the biology of the silkworm & silk-making by the worm." (*Silk* - Deborah)

"Once again, I'm not sure who Smellie is. I'd like to know more about the sources for this entry." (*Silk* - Martha)

"The information seems very reliable - it's fairly detailed." (*Needle* - Linda)

"It's simple, though, and so while none of the 'facts' seem questionable, I'm left feeling that there must be a more interesting ie. More complete treatment of what quantity and quality are than what I read here." (*Algebra* - Gloria)

- **Bias**

(Evaluations of reliability related to the text as showing or not showing evidence of bias or subjectivity, including: the presence of bias; objectivity or subjectivity of treatment; having the nature of opinion.)

"I did not feel the author was biased in any way." (*Algebra* - Anita)

"There is a highly normative stance regarding the ways in which parents and gender expectations ought to be." (*Parental Duty* - Bonnie)

"The rules seem quite subjective, which also makes the information less reliable."
(*Painting* - Susan)

"There seems to be very little opinion." (*Anabaptists* - George)

"It appears to be a well-educated person's opinion on the subject." (*Medicine* - Pamela)

- **Specificity**

(Evaluations of reliability related to the text that take into account degree of generalizability or specificity across time, place, or populations, including: stability or changeability over time; narrowness of scope.)

"This is completely out of date." (*Food of Plants* - Emma)

"The information is quite reliable. It is not historical or something that could be interpreted and it isn't something that could change over time - what is said here is still true today." (*Algebra* - Frances)

"I don't know about the reliability of the encyclopedia at the time this entry was written." (*Minors* - Martha)

"It's a good representation of how Anabaptists think about themselves." (*Anabaptists* - Benjamin)

"things are likely different on modern farms and in different climates (also, for different types of potatoes)." (*Potatoes* - Regina)

- **Discourse**

(Evaluations of reliability related to the text as being a particular kind of discourse, including: the nature of the topic; being scientific; being an encyclopedia entry.)

"Hard to say what reliable information about beauty would be." (*Beauty* - Linda)

"It seemed strange when the author started discussing the moon + how it falls in relation to gravity? It just seemed very unscientific." (*Mechanics* - Anita)

"Though the fact that it's an encyclopedia makes me hope they're decently reliable."

(*Silk* - Martha)

"I haven't used an encyclopedia for some time, so I don't remember whether sources are usually cited." (*Gardening* - Susan)

"The critique of the gardens at Versailles is not something I would expect to find in an encyclopedia entry." (*Gardening* - Susan)

REFERENCES

- Adams, M. J. (1990). *Beginning to read: Thinking and learning about print*. Cambridge, MA: The MIT Press.
- Afflerbach, P. (1990a). The influence of prior knowledge and text genre on readers' prediction strategies. *Journal of Reading Behavior*, 22, 131-148.
- Afflerbach, P. (1990b). The influence of prior knowledge on expert readers' main idea construction strategies. *Reading Research Quarterly*, 25, 31-46.
- Afflerbach, P. (2000). Verbal reports and protocol analysis. In M. L. Kamil, P. B. Mosenthal, P. D. Pearson, & R. Barr (Eds.), *Handbook of reading research* (Vol. 3, pp. 163-179). Mahwah, NJ: Lawrence Erlbaum Associates.
- Ainley, M., Hidi, S., & Berndorff, D. (2002). Interest, learning, and the psychological processes that mediate their relationship. *Journal of Educational Psychology*, 94, 545-561.
- Alexander, P. A. (1997). Mapping the multidimensional nature of domain learning: The interplay of cognitive, motivational, and strategic forces. In M. L. Maehr & P. R. Pintrich (Eds.), *Advances in motivation and achievement* (Vol. 10, pp. 213-250). Greenwich, CT: JAI Press.
- Alexander, P. A. (1998). The nature of disciplinary and domain learning: The knowledge, interest, and strategic dimensions of learning from subject matter text. In C. R. Hynd (Ed.), *Learning from text across conceptual domains* (pp. 263-287). Mahwah, NJ: Lawrence Erlbaum Associates.
- Alexander, P. A. (2003a). The development of expertise: The journey from acclimation to proficiency. *Educational Researcher*, 32(8), 10-14.

- Alexander, P. A. (2003b). Profiling the developing reader: The interplay of knowledge, interest, and strategic processing. In C. M. Fairbanks, J. Worthy, B. Maloch, J. V. Hoffman, & D. L. Schallert (Eds.), *The Fifty-first Yearbook of the National Reading Conference* (pp. 47-65). Oak Creek, WI: National Reading Conference.
- Alexander, P. A. (2006). The path to competence: A lifespan developmental perspective on reading. *Journal of Literacy Research*, 37, 413-436.
- Alexander, P. A., Dinsmore, D. L., Fox, E., Grossnickle, E. M., Loughlin, S. M., Maggioni, L., Parkinson, M., & Winters, F. I. (2011). Higher-order thinking and knowledge: Domain-general and domain-specific trends and future directions. In G. Schraw (Ed.), *Assessment of higher order thinking skills* (pp. 47-88). Charlotte, NC: Information Age Publishers.
- Alexander, P. A. and the DRLRL (2012). Reading into the future: Competence for the 21st century. *Educational Psychologist*. (manuscript accepted pending revision)
- Alexander, P. A., & Fox, E. (2004). A historical perspective on reading research and practice. In R. B. Ruddell & N. J. Unrau (Eds.), *Theoretical models and processes of reading* (5th ed., pp. 33-68). Newark, DE: International Reading Association.
- Alexander, P. A., & Jetton, T. L. (2000). Learning from text: A multidimensional and developmental perspective. In M. L. Kamil, P. B. Mosenthal, P. D. Pearson, & R. Barr (Eds.), *Handbook of reading research* (Vol. 3, pp. 285-310). Mahwah, NJ: Lawrence Erlbaum Associates.

- Anderson, R. C. (2004). Role of the reader's schema in comprehension, learning, and memory. In R. B. Ruddell & N. J. Unrau (Eds.), *Theoretical models and processes of reading* (5th ed., (pp. 594-606). Newark, DE: International Reading Association.
- Applegate, A. J., & Applegate, M. D. (2004). The Peter effect: Reading habits and attitudes of preservice teachers. *The Reading Teacher*, 57, 554-563.
- Athey, I. (1985). Reading research in the affective domain. In H. Singer & R. B. Ruddell (Eds.), *Theoretical models and processes of reading* (3rd ed., pp. 527-557). Newark, DE: International Reading Association.
- Barone, D. M. (2004). Case-study research. In N. K. Duke & M. H. Mallette (Eds.), *Literacy research methodologies* (pp. 7-27). New York: The Guilford Press.
- Bartlett, F. C. (1995). *Remembering*. New York: Cambridge University Press.
(Original work published 1932)
- Bazerman, C. (1985). Physicists reading physics: Schema-laden purposes and purpose-laden schemas. *Written Communication*, 2, 3-23.
- Bereiter, C., & Bird, M. (1985). Use of thinking aloud in identification and teaching of reading comprehension strategies. *Cognition and Instruction*, 2, 136-156.
- Bereiter, C., & Scardamalia, M. (1986). Educational relevance of the study of expertise. *Interchange*, 17, 10-19.
- Bereiter, C., & Scardamalia, M. (1993). *Surpassing ourselves: An inquiry into the nature and implications of expertise*. Chicago, IL: Open Court.

- Berntsen, D., & Larsen, S. F. (1996). Personal and nonpersonal narrativity in reading. In R. J. Kreuz & M. S. MacNealy (Eds.), *Empirical approaches to literature and aesthetics* (pp. 615-631). Norwood, NJ: Ablex Publishing.
- Birkmire, D. P. (1985). Text processing: The influence of text structure, background knowledge, and purpose. *Reading Research Quarterly*, 20, 314-326.
- Bloom, B. J., Hastings, J. R., & Madaus, G. F. (1971). *Handbook on formative and summative evaluation of learning*. New York: McGraw-Hill.
- Brown, A. L. (1980). Metacognitive development and reading. In R. Spiro, B. C. Bruce, & W. F. Brewer (Eds.), *Theoretical issues in reading comprehension* (pp. 453-481). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Brown, A. L., & Campione, J. C. (1990). Communities of learning and thinking, or a context by any other name. In D. Kuhn (Ed.), *Developmental perspectives on teaching and learning thinking skills* (p. 108-126). Basel: Karger.
- Brown, A. L., Campione, J. C., & Day, J. D. (1981). Learning to learn: On training students to learn from texts. *Educational Researcher*, 10(2), 14-21.
- Caron, T. A. (1989). Strategies for reading expository prose. In S. McCormick & J. Zutell (Eds.), *Cognitive and social perspectives for literacy research and instruction, 38th yearbook of the National Reading Conference* (pp. 293-300). Chicago: National Reading Conference.
- Center, S. S. (1952). *The art of book reading*. New York: Charles Scriber's Sons.
- Chall, J. S. (1983). *Stages of reading development*. New York: McGraw-Hill.

- Chapman, J. W., & Tunmer, W. E. (2003). Reading difficulties, reading-related self-perceptions, and strategies for overcoming negative self-beliefs. *Reading & Writing Quarterly, 19*, 5-24.
- Charney, D. (1993). A study in rhetorical reading: How evolutionists read “The spandrels of San Marco.” In J. Selzer (Ed.), *Understanding scientific prose* (pp. 97-118). Madison, WI: University of Wisconsin Press.
- Christensen, L. M. (2008). The paradox of legal expertise: A study of experts and novices reading the law. *Brigham Young University Education & Law Journal, 1*, 53-87.
- Christopherson, S. L., Schultz, C. B., & Waern, Y. (1981). The effect of two contextual conditions on recall of a reading passage and on thought processes in reading. *Journal of Reading, 24*, 573-578.
- Clay, M. M. (1989). Concepts About Print in English and other languages. *The Reading Teacher, 42*, 268-276.
- Common Core State Standards Initiative (2010). *English Language Arts standards*. <http://www.corestandards.org/the-standards/english-language-arts-standards>
- Coté, N., Goldman, S. R., & Saul, E. U. (1998). Students making sense of informational text: Relations between processing and representation. *Discourse Processes, 25*, 1-53.
- Creswell, J. W. (1998). *Qualitative inquiry and research design*. Thousand Oaks, CA: Sage Publications.

- Daneman, M. (1991). Individual differences in reading skills. In R. Barr, M.L. Kamil, P. Mosenthal, & P.D. Pearson (Eds.), *Handbook of reading research* (Vol. 2, pp. 512-538). Longman, NY: Lawrence Erlbaum Associates.
- de Beaugrande, R. (1981). Design criteria for process models of reading. *Reading Research Quarterly*, *16*, 261-315.
- Deegan, D. H. (1995). Exploring individual differences among novices reading in a specific domain: The case of law. *Reading Research Quarterly*, *30*, 154-170.
- Dee-Lucas, D., & Larkin, J. H. (1988). Novice rules for assessing importance in scientific texts. *Journal of Memory and Language*, *27*, 288-308.
- Dillon, A. (1991). Readers' models of text structures: The case of academic articles. *International Journal of Man-Machine Studies*, *35*, 913-925.
- Dillon, A., & Schapp, D. (1996). Expertise and the perception of shape in information. *Journal of the American Society for Information Science*, *47*, 786-788.
- Dinsmore, D., Fox, E., Parkinson, M. M., & Rahman, T. (2010, May). A deeper look at why readers succeed or fail. In D. McNamara (Chair), *Integration, depth, and complexity: Characterizing reader types through multidimensional profiling*. Symposium presented at the annual meeting of the American Educational Research Association, New York.
- Drum, P. A. (1985). Retention of text information by grade, ability, and study. *Discourse Processes*, *8*, 21-52.
- Duffy, G., Israel, S. E., Davis, S. G., Doyle, K. K., Gavigan, K. W., Gray, E. S., Jones, A., Kear, K. A., Qualls, R., Mason, P., Parsons, S., & Williams, B.

(2009). Where to from here? Themes, trends, and questions. In S. E. Israel & G. G. Duffy (Eds.), *Handbook of research on reading comprehension* (pp. 668-675). New York: Routledge.

Educational Policies Commission (1958). *Mass communication and education*. Washington, DC: National Education Association.

Ericsson, K. A., & Smith, J. (1991). Prospects and limits of the empirical study of expertise: An introduction. In K. A. Ericsson & J. Smith (Eds.), *Toward a general theory of expertise* (pp. 1-38). New York: Cambridge University Press.

Erikson, E. H. (1980). *Identity and the life cycle*. New York: W. H. Norton. (Original work published 1959)

Fink, R. P. (1998). Literacy development in successful men and women with dyslexia. *Annals of Dyslexia*, 48, p. 311-346.

Fox, E. (2009). The role of reader characteristics in processing and learning from informational text. *Review of Educational Research*, 79, 197-261.

Fox, E. (2010, May). *Does book reading matter, and for whom? Leisure reading habits and reading performance for male and female undergraduates*. Poster presented at the annual meeting of the American Educational Research Association, Denver.

Fox, E., & Alexander, P. A. (2004, April). Reading, interest, and domain learning. In C. Kardash (Chair). *The role of affect in text processing/comprehension: Theoretical and practical implications*. Symposium presented at the annual meeting of the American Educational Research Association, San Diego.

- Fox, E., & Alexander, P. A. (2009). Text comprehension: A retrospective, perspective, and prospective. In S. E. Israel & G. G. Duffy (Eds.), *Handbook of research on reading comprehension* (pp. 227-239). New York: Routledge.
- Fox, E., & Alexander, P. A. (2011). Learning to read. In R. Mayer & P. A. Alexander (Eds.), *Handbook of research on learning and instruction* (pp. 7-31). New York: Routledge.
- Fox, E., Alexander, P. A., & Dinsmore, D. (2007, April). Situational success at reading challenging texts: Exposing the fragile understanding of college students. In P. Alexander (Chair). *Fragile understanding: When good ideas go bad*. Symposium presented at the annual meeting of the American Educational Research Association, Chicago, IL.
- Fox, E., & Dinsmore, D. L. (2009, August). Reading competence and reading goals in four gifted young adolescent readers. In P. Alexander (Chair), *What is competence really? Part I: seeking threads in empirical research*. Symposium presented at the biennial meeting of the European Association for Research in Learning and Instruction, Amsterdam, Netherlands.
- Fox, E., Dinsmore, D. L., & Alexander, P. A. (2010). Reading competence, interest, and reading goals in three gifted young adolescent readers. (Special issue on motivation and giftedness) *High Ability Studies*, 21(2), 165-178.
- Fox, E., Dinsmore, D., Maggioni, L., & Alexander, P. (2008, March). *Undergraduates' independent and scaffolded reading of course texts: Further evidence of fragile understanding*. Paper presented at the annual meeting of the American Educational Research Association, New York.

- Fox, E., Dinsmore, D. L., Maggioni, L., & Alexander, P. A. (2009, April). *Factors associated with undergraduates' success in reading and learning from course texts*. Paper presented at the annual meeting of the American Educational Research Association, San Diego.
- Fox, E., Maggioni, L., Dinsmore, D., & Alexander, P. (2008, March). *The multi-layered reading goals of expert readers: Bridging between knowledge, interest, and strategy use*. Paper presented at the annual meeting of the American Educational Research Association, New York.
- Fox, E., Maggioni, L., & Riconscente, M. (2005, August). Exploring expertise in reading and with reading: Characteristics and methodological issues. In P. Alexander (Chair). *The road to domain expertise: Texts, situations, technology, and methodology*. Symposium presented at the annual meeting of the American Psychological Association, Washington, DC.
- Fox, E., & Riconscente, M. M. (2008). Metacognition and self-regulation in James, Piaget, and Vygotsky. (Special issue on metacognition and self-regulated learning) *Educational Psychology Review*, 20, 373-389.
- Gadsden, V. L. (2000). Intergenerational literacy within families. In M. L. Kamil, P. B. Mosenthal, P. D. Pearson, & R. Barr (Eds.), *Handbook of reading research* (Vol. 3, pp. 871-887). Mahwah, NJ: Lawrence Erlbaum Associates.
- Gates, A. I. (1947). *The improvement of reading* (3rd ed.). New York: The Macmillan Company.
- Gee, J. P. (2001). Reading as situated language: A sociocognitive perspective. *Journal of Adolescent & Adult Literacy*, 44, 714-725.

- Geisler, C. (1994). *Academic literacy and the nature of expertise: Reading, writing, and knowing in academic philosophy*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Gibson, E. J., & Levin, H. (1975). *The psychology of reading*. Cambridge, MA: The MIT Press.
- Goldman, S. R., Golden, R. M., & van den Broek, P. (2007). Why are computational models of text comprehension useful? In F. Schmalhofer & C. A. Perfetti (Eds.), *Higher level language processes in the brain: Inference and comprehension processes* (pp. 27-51). Mahwah, NJ: Lawrence Erlbaum Associates.
- Graesser, A. C., Millis, K. K., & Zwaan, R. A. (1997). Discourse comprehension. *Annual Review of Psychology*, 48, 163-189.
- Graves, B. (2001). Literary expertise and analogical reasoning: Building global themes. *Empirical Studies of the Arts*, 19, 47-63.
- Gray, W. S. (1920). Value of informal tests of reading accomplishment. *The Journal of Educational Research*, 1, 103-111.
- Gray, W. S. (1925a). A modern program of reading instruction for the grades and the high school. In G. W. Whipple (Ed.), *Report of the National Committee on Reading: 24th yearbook of the National Society for the Study of Education* (pp. 21-73). Chicago, IL: NSSE.
- Gray, W. S. (1925b). Reading activities in school and social life. In G. W. Whipple (Ed.), *Report of the National Committee on Reading: 24th yearbook of the National Society for the Study of Education* (pp. 1-8). Chicago, IL: NSSE.

- Gray, W. S. (1937). The teaching of reading: A second report. *The Elementary School Journal*, 37(9), 688-694.
- Gray, W. S. (1940). Reading and factors influencing reading efficiency. In W. S. Gray (Ed.), *Reading in general education: An exploratory study* (p. 18-44). Washington, DC: American Council on Education.
- Gray, W. S. (1947). The social effects of reading. *The School Review*, 55(5), 269-277.
- Gray, W. S. (1949). Basic competencies in efficient reading. In W. S. Gray (Ed.), *Reading in an age of mass communication* (pp. 58-74). New York: The National Council of Teachers of English.
- Gray, W. S. (1951). Foundation stones in the road to better reading. *The Elementary School Journal*, 51, 427-435.
- Gray, W. S. (1954). The nature of mature reading. *The School Review*, 62, 393-398.
- Gray, W. S., & Rogers, B. (1956). *Maturity in reading, its nature and appraisal*. Chicago, IL: The University of Chicago Press.
- Grice, H. P. (1975). Logic and conversation. In P. Cole & J. L. Morgan (Eds.), *Syntax and semantics, Volume 3: Speech acts* (pp. 41-58). New York: Academic Press.
- Guthrie, J. T., & Wigfield, A. (1999). How motivation fits into a science of reading. *Scientific Studies of Reading*, 2, 199-205.
- Guthrie, J. T., & Wigfield, A. (2000). Engagement and motivation in reading. In M. L. Kamil, P. B. Mosenthal, P. D. Pearson, & R. Barr (Eds.), *Handbook of reading research* (Vol. 3, pp. 403-422). Mahwah, NJ: Lawrence Erlbaum Associates.

- Haas, C. (1994). Learning to read biology: One student's rhetorical development in college. *Written Communication, 11*, 43-84.
- Haas, C., & Flower, L. (1988). Rhetorical reading strategies and the construction of meaning. *College Composition and Communication, 39*, 167-183.
- Hare, V. C. (1981). Readers' problem identification and problem solving strategies for high- and low-knowledge articles. *Journal of Reading Behavior, 13*(4), 359-365.
- Harris, T. L. (1948). Making reading an effective instrument of learning in the content fields. In N. B. Henry (Ed.), *The psychology of learning: 41st yearbook of the National Society for the Study of Education* (pp. 116-135). Chicago, IL: NSSE.
- Hartman, D. K. (1995). Eight readers reading: The intertextual links of proficient readers reading multiple passages. *Reading Research Quarterly, 30*, 520-561.
- Hochberg, J., & Brooks, V. (1976). Reading as an intentional behavior. In H. Singer & R. B. Ruddell (Eds.), *Theoretical models and processes of reading* (2nd ed., pp. 243-251). Newark, DE: International Reading Association.
- Jacobs, V. A. (2008). Adolescent literacy: Putting the crisis in context. *Harvard Educational Review, 78*, 7-39.
- Johnston, P., & Afflerbach, P. (1985). The process of constructing main ideas from text. *Cognition and Instruction, 2*, 207-232.
- Johns, J. L. (1980). First graders' concepts about print. *Reading Research Quarterly, 15*, 529-549.

- Judd, C. H., & Buswell, G. T. (1922). *Silent reading: A study of the various types*. Chicago, IL: The University of Chicago.
- King, M. L. (1967). The importance and nature of critical reading. In M. L. King, B. D. Ellinger, & W. Wolf (Eds.), *Critical reading* (pp. 1-3). New York: J. B. Lippincott.
- Kintsch, W. (1980). Learning from text, levels of comprehension, or: Why anyone would read a story anyway. *Poetics*, 9, 87-98.
- Kintsch, W. (1993). Text comprehension, memory, and learning. *American Psychologist*, 49, 294-303.
- Kintsch, W. (1998). *Comprehension*. New York: Cambridge University Press.
- Kintsch, W., & van Dijk, T. A. (1978). Toward a model of text comprehension and product. *Psychological Review*, 85, 363-394.
- Kintsch, W., & Yarbrough, J. C. (1982). Role of rhetorical structure in text comprehension. *Journal of Educational Psychology*, 74, 628-834.
- Kobayashi, K. (2007). The influence of critical reading orientation on external strategy use during expository text reading. *Educational Psychology*, 27, 363-375.
- Kucan, L., & Beck, I. (1997). Thinking aloud and reading comprehension research: Inquiry, instruction, and social interaction. *Review of Educational Research*, 67, 271-299.
- Kulikowich, J. M., & Alexander, P. A. (2010). Intentionality to learn in an academic domain. [Special Issue on Overlaps between socio-emotional and academic development] *Early Education and Development*, 21, 724-743.

- Langer, J. (1993). *Approaches toward meaning in low- and high-rated readers* (Report Series 2.20). Albany, NY: National Research Center on Literature Teaching & Learning.
- Leinhardt, G., & Young, K. M. (1996). Two texts, three readers: Distance and expertise in reading history. *Cognition and Instruction, 14*, 441-486.
- Lundeberg, M. A. (1987). Metacognitive aspects of reading comprehension: Studying understanding in legal case analysis. *Reading Research Quarterly, 22*, 407-432.
- Manzo, A. V., Manzo, U., Barnhill, A., & Thomas, M. (2000). Proficient reader subtypes: Implications for literacy theory, assessment, and practice. *Reading Psychology, 21*, 217-232.
- Martin, S. H. (1988). A description of cognitive processes during reading and writing. *Reading Psychology, 9*, 1-15.
- Marton, F., & Booth, S. (1997). *Learning and awareness*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Marton, F., & Säljö, R. (1997). Approaches to learning. In F. Marton, D. Hounsell, & N. Entwisle (Eds.), *The experience of learning* (2nd ed., pp. 39-58). Edinburgh: Scottish Academic Press.
- Marton, F., & Svensson, L. (1979). Conceptions of research in human learning. *Higher Education, 8*, 471-496.
- Mathewson, G. C. (2004). Model of attitude influence upon reading and learning to read. In R. B. Ruddell & N. J. Unrau (Eds.), *Theoretical models and*

processes of reading (5th ed., pp. 1431-1461). Newark, DE: International Reading Association.

Maxwell, J. A. (2006). Literature reviews of, and for, educational research: A commentary on Boote and Beile's "Scholars before researchers." *Educational Researcher*, 35(9), 28-31.

McGill-Franzen, A. (2010). The National Early Literacy Panel Report: Summary, commentary, and reflections on policies and practices to improve children's early literacy (Guest editor's introduction). *Educational Researcher*, 39, 275-278.

McMackin, M. C., & Lawrence, S. (2001). Investigating inferences: Constructing meaning from expository texts. *Reading Horizons*, 42, 117-137.

Meichenbaum, D., & Biemiller, A. (1992). In search of student expertise in the classroom: A metacognitive analysis. In M. Pressley, K. R. Harris, & J. T. Guthrie (Eds.), *Promoting academic competence and literacy in school* (pp. 3-56). San Diego, CA: Academic Press.

Mey, J. L. (2003). Literary pragmatics. In D. Schiffrin, D. Tannen, & H. E. Hamilton (Eds.), *Handbook of discourse analysis* (pp. 787-797). Oxford, UK: Blackwell Publishing.

Meyer, B. J. F. (1987). Following the author's top-level organization: An important skill for reading comprehension. In R. J. Tierney, P. L. Anders, & J. N. Mitchell (Eds.), *Understanding readers' understanding* (pp. 59-76). Hillsdale, NJ: Lawrence Erlbaum Associates.

- Montessori, M. (1972). *The discovery of the child*. (M. J. Costelloe, Trans.). New York: Ballantine Books. (Original work published 1962)
- Moore, P. J., & Scevak, J. J. (1997). Learning from texts and visual aids: A developmental perspective. *Journal of Research in Reading, 20*, 205-223.
- Neisser, U. (1967). *Cognitive psychology*. Englewood Cliffs, NJ: Prentice-Hall, Inc.
- Neisser, U. (1976). *Cognition and reality*. San Francisco, CA: W. H. Freeman and Company.
- Neisser, U. (1988). Five kinds of self-knowledge. *Philosophical Psychology, 1*, 35-59.
- Neutelings, R., & Maat, H. P. (1997). Investigating the processes of reading-to-assess among Dutch legislators. *Journal of Literacy Research, 29*, 47-71.
- Olshavsky, J. E. (1976-1977). Reading as problem-solving: An investigation of strategies. *Reading Research Quarterly, 12*, 654-674.
- Olson, G. M., Duffy, S. A., & Mack, R. L. (1984). Thinking-out-loud as a method for studying real-time comprehension processes. In D. E. Kieras & M. A. Just (Eds.), *New methods in reading comprehension research* (pp. 253-286). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Ong, W. J. (1982). *Orality and literacy: The technologizing of the word*. New York: Routledge.
- Pratchett, T. (2010). *I shall wear midnight*. New York: Harper Collins.
- Pearson, P. D., & Tierney, R. J. (1984). On becoming a thoughtful reader: Learning to read like a writer. In K. J. Rehage, A. C. Purves, & O. S. Niles (Eds.),

- Becoming readers in a complex society: 83rd yearbook of the National Society for the Study of Education* (pp. 144-173). Chicago, IL: NSSE.
- Perry, W. G., Jr. (1959). Students' use and misuse of reading skills: A report to a faculty. *Harvard Educational Review*, 29, 193-200.
- Perry, W. G., Jr. (1970). *Forms of intellectual and ethical development in the college years*. New York: Holt, Rinehart, & Winston.
- Perry, W. G., Jr. (1981). Cognitive and ethical growth: The making of meaning. In A. Chickering (Ed.), *The modern American college* (pp. 76-116). San Francisco: Jossey Bass.
- Peskin, J. (1998). Constructing meaning when reading poetry: An expert-novice study. *Cognition and Instruction*, 16, 235-263.
- Phillips, J. (1988). Young readers' inference strategies in reading comprehension. *Cognition and Instruction*, 16, 193-222.
- Piaget, J. (1968). *Six psychological studies*. (A. Tenzer, Trans.). New York: Random House. (Original work published 1964)
- Pichert, J. W., & Anderson, R. C. (1977). Taking different perspectives on a story. *Journal of Educational Psychology*, 69, 305-315.
- Pressley, M., & Afflerbach, P. (1995). *Verbal protocols of reading: The nature of constructively responsive reading*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Preston, R. C. (1949). The changed role of reading. In W. S. Gray (Ed.), *Reading in an age of mass communication* (pp. 1-18). New York: The National Council of Teachers of English.

- Pritchard, R. (1990). The effects of cultural schemata on reading processing strategies. *Reading Research Quarterly, 25*, 273-295.
- Rahman, T., Alexander, P. A., Mislavy, R., & Fox, E. (2011, April). *Reading comprehension assessment: A case of misalignment*. Paper presented at the annual meeting of the American Educational Research Association, New Orleans.
- RAND Reading Study Group (2002). *Reading for understanding: Toward an R&D program in reading comprehension*. Santa Monica, CA: RAND.
- Rosenblatt, L. M. (1978). *The reader, the text, the poem: The transactional theory of literary work*. Carbondale, IL: Southern Illinois University Press.
- Rosenblatt, L. M. (2004). The transactional theory of reading and writing. In R. B. Ruddell & N. J. Unrau (Eds.), *Theoretical models and processes of reading* (5th ed., pp. 1363-1398). Newark, DE: International Reading Association.
- Rouet, J., Favart, M., Britt, M. A., & Perfetti, C. A. (1997). Studying and using multiple documents in history: Effects of discipline expertise. *Cognition and Instruction, 15*, 85-106.
- Rowe, K. J. (1991). The influence of reading activity at home on students' attitudes towards reading, classroom attentiveness and reading achievement: An application of structural equation modelling. *British Journal of Educational Psychology, 61*(1), 19-35.
- Rumelhart, D. E., & Norman, D. A. (1976). *Accretion, tuning, and restructuring: Three modes of learning*. (Report no. 7602). (ERIC Document Reproduction Service No. ED134902)

- Russell, D. H. (1949). Reading and child development. In N. B. Henry & A. I. Gates (Eds.), *Reading in the elementary school: 48th yearbook of the National Society for the Study of Education, Part II* (pp. 10-32). Chicago, IL: NSSE.
- Russell, D. H. (1961). *Children learn to read*. (2nd Ed.). New York: Ginn and Company.
- Säljö, R. (1997). Reading and everyday conceptions of knowledge. In F. Marton, D. Hounsell, & N. Entwisle (Eds.), *The experience of learning* (2nd ed., pp. 89-105). Edinburgh: Scottish Academic Press.
- Scardamalia, M., & Bereiter, C. (1991). Literate expertise. In K. A. Ericsson & J. Smith (Eds.), *Toward a general theory of expertise* (pp. 172-194). New York: Cambridge University Press.
- Schiefele, U. (1999). Interest and learning from text. *Scientific Studies of Reading*, 3, 257-279.
- Schooler, T. Y. E., Kennet, J., Wiley, J., & Voss, J. F. (1996). On the processing of political editorials. In R. S. Kreuz & M. S. MacNealy (Eds.), *Empirical approaches to literature and aesthetics* (pp. 445-459). Norwood, NJ: Ablex Publishing.
- Schram, T. H. (2003). *Conceptualizing qualitative inquiry*. Upper Saddle River, NJ: Merrill Prentice Hall.
- Schraw, G. (2006). Knowledge structures and processes. In P. A. Alexander & P. H. Winne (Eds.), *Handbook of educational psychology* (2nd ed., pp. 245-263). Mahwah, NJ: Lawrence Erlbaum Associates.

- Schraw, G., & Bruning, R. (1996). Readers' implicit models of reading. *Reading Research Quarterly, 31*, 290-305.
- Schraw, G., & Bruning, R. (1999). How implicit models of reading affect motivation to read and reading engagement. *Scientific Studies of Reading, 3*, 281-302.
- Schutte, N. S., & Malouff, J. M. (2007). Dimensions of reading motivation: Development of an adult reading motivation scale. *Reading Psychology, 28*, 469-489.
- Schwegler, R. A., & Shamoan, L. K. (1991). Meaning attribution in ambiguous texts in sociology. In C. Bazerman & J. Paradis (Eds.), *Textual dynamics of the professions* (pp. 216-233). Madison, WI: University of Wisconsin Press.
- Shanahan, T. (1992). Reading comprehension as a conversation with an author. In M. Pressley, K. R. Harris, & J. T. Guthrie (Eds.), *Promoting academic competence and literacy in school* (pp. 129-148). San Diego, CA: Academic Press.
- Shanahan, T., & Shanahan, C. (2008). Teaching disciplinary literacy to adolescents: Rethinking content-area literacy. *Harvard Educational Review, 78*, 40-59.
- Shapiro, A. M. (2004). How including prior knowledge as a subject variable may change outcomes of learning research. *American Educational Research Journal, 41*, 159-189.
- Shearer, B. A., Lundeberg, M. A., & Coballes-Vega, C. (1997). Making the connection between research and reality: Strategies teachers use to read and evaluate journal articles. *Journal of Educational Psychology, 89*, 592-598.

- Simpson, M. L., & Nist, S. L. (2002). Encouraging active reading at the college level. In C. C. Block & M. Pressley (Eds.), *Comprehension instruction: Research-based best practices* (pp. 365-379). New York: The Guilford Press.
- Smellie, W. (Ed.). (1979). *Encyclopædia Britannica* (Vols. I-III). Chicago, IL: Encyclopædia Britannica. (Original work published 1768-1771)
- Smith, M. C. (1996). Differences in adults' reading practices and literacy proficiencies. *Reading Research Quarterly, 31*, 196-219.
- Spiro, R., Bruce, B. C., & Brewer, W. F. (1980). Introduction. In R. Spiro, B. C. Bruce, & W. F. Brewer (Eds.), *Theoretical issues in reading comprehension* (pp. 1-5). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Spufford, F. (2002). *The child that books built*. New York: Henry Holt and Company.
- Stake, R. E. (2006). *Multiple case study analysis*. New York: The Guilford Press.
- Stanovich, K. E. (1986). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. *Reading Research Quarterly, 21*, 340-406.
- Stanovich, K. E., West, R. F., & Harrison, M. H. (1995). Knowledge growth and maintenance across the life span: The role of print exposure. *Developmental Psychology, 31*, 811-826.
- Steinke, J. (1995). Reaching readers: Assessing readers' impressions of science news. *Science Communication, 16*, 432-453.
- Stemler, S. E. (2004). A comparison of consensus, consistency, and measurement approaches to estimating interrater reliability. *Practical Assessment, Research & Evaluation, 9*(4). Retrieved January 29, 2012 from

<http://PAREonline.net/getvn.asp?v=9&n=4> .

- Strang, R. (1938). *Problems in the improvement of reading in high school and college*. Lancaster, PA: The Science Press.
- Strang, R. (1942). *Exploration in reading patterns*. Chicago, IL: University of Illinois Press.
- Strang, R., McCullough, C. M., & Traxler, A. E. (1955). *Problems in the improvement of reading* (2nd edition). New York: McGraw-Hill.
- Thorndike, E. L. (1917). Reading as reasoning: A study of mistakes in paragraph reading. *Journal of Educational Psychology*, 8, 323-332.
- Thorndike, E. L. (1934a). Improving the ability to read (Part 1). *Teachers College Record*, 36(1), 1-19.
- Thorndike, E. L. (1934b). Improving the ability to read (Part 2). *Teachers College Record*, 36(2), 123-144.
- Thorndike, E. L. (1934c). Improving the ability to read (Part 3). *Teachers College Record*, 36(3), 229-241.
- Tierney, R. J., LaZansky, J., Raphael, T., & Cohen, P. (1987). Author's intentions and reader's interpretations. In R. J. Tierney, P. L. Anders, & J. N. Mitchell (Eds.), *Understanding readers' understanding* (pp. 205-226). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Toulmin, S. E. (2003). *The uses of argument*. New York: Cambridge University Press. (Updated edition - original work published 1958)

- van den Broek, P., Lorch, R. F., Jr., Linderholm, T., & Gustafson, M. (2001). The effects of readers' goals on inference generation and memory for texts. *Memory & Cognition, 29*, 1081-1087.
- van den Broek, P., Ridsen, K., Fletcher, C. R., & Thurlow, R. (1996). A "landscape" view of reading: Fluctuating patterns of activation and the construction of a stable memory representation. In B. K. Britton & A. C. Graesser (Eds.), *Models of understanding text* (pp. 165-187). Mahwah, NJ: Lawrence Erlbaum Associates.
- van Dijk, T. A. (1999). Context models in discourse processing. In H. van Oostendorp & S. R. Goldman (Eds.), *The construction of mental representations during reading* (p. 123-148). Mahwah, NJ: Lawrence Erlbaum Associates.
- VanSledright, B. A. (2002). Fifth graders investigating history in the classroom: Results from a researcher-practitioner design experiment. *The Elementary School Journal, 103*, 131-160.
- Venezky, R. L. (1991a). *Assessing higher order thinking and communications skills: Literacy*. Commissioned paper prepared for workshop on Assessing Higher Order Thinking & Communication Skills in College Graduates. Washington, DC: National Center for Education Statistics.
- Venezky, R. L. (1991b). The development of literacy in the industrialized nations of the west. In R. Barr, M.L. Kamil, P. Mosenthal, & P.D. Pearson (Eds.), *Handbook of reading research* (Vol. 2, pp. 46-67). Longman, NY: Lawrence Erlbaum Associates.

- Voss, J. F., & Bisanz, G. L. (1985). Knowledge and the processing of narrative and expository texts. In B. K. Britton & J. B. Black (Eds.), *Understanding expository text* (pp. 173-198). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Voss, J. F., & Silfies, L. N. (1996). Learning from history text: The interaction of knowledge and comprehension skill with text structure. *Cognition and Instruction, 14*, 45-68.
- Vygotsky, L. (1986). *Thought and language*. (A. Kozulin, Trans.). Cambridge, MA: MIT Press.
- Wade, S. E., Buxton, W. M., & Kelly, M. (1999). Using think-alouds to examine reader-text interest. *Reading Research Quarterly, 34*, 194-216.
- Waples, D. (1938). *People and print: Social aspects of reading during the depression*. Chicago, IL: University of Chicago Press.
- Waples, D., Berelson, B., & Bradshaw, F. R. (1940). *What reading does to people*. Chicago, IL: University of Chicago Press.
- Wineburg, S. S. (1991a). Historical problem solving: A study of the cognitive processes used in the evaluation of documentary and pictorial evidence. *Journal of Educational Psychology, 83*, 73-87.
- Wineburg, S. S. (1991b). On the reading of historical texts: Notes on the breach between school and academy. *American Educational Research Journal, 28*, 495-519.
- Wineburg, S. (1998). Reading Abraham Lincoln: An expert/expert study in the interpretation of historical texts. *Cognitive Science, 22*, 319-346.

- Wyatt, D., Pressley, M., El-Dinary, P. B., Stein, S., Evans, P., & Brown, R. (1993). Comprehension strategies, worth and credibility monitoring, and evaluations: Cold and hot cognition when experts read professional articles that are important to them. *Learning and Individual Differences, 5*, 49-72.
- Yin, R. K. (2009). *Case study research: Design and methods* (4th ed.). Thousand Oaks, CA: Sage Publications.
- Zeitz, C. M. (1994). Expert-novice differences in memory, abstraction, and reasoning in the domain of literature. *Cognition and Instruction, 12*, 277-213.