

ABSTRACT

Title of dissertation: RELATIONSHIPS AMONG INTERNALIZING
SYMPTOMS IN KINDERGARTEN AND LATER
SELF-CONCEPT AND COMPETENCE

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This study used a longitudinal sample of 9,160 children participating in the Early Childhood Longitudinal Study- Kindergarten Cohort (ECLS-K) to: (a) describe characteristics of children who present with elevated internalizing symptomatology, (b) investigate stability of elevated internalizing status across early and middle childhood, and (c) explore possible relationships between elevated symptomatology in kindergarten and later academic competence and self-concept. Children were dichotomously categorized at kindergarten (Time 1), three years later (Time 2) and five years later (Time 3) as having either elevated or typical levels of internalizing symptomatology based on their scores on the internalizing subscale of an adapted version of the Social Skills Rating Scale (SSRS). Elevated internalizing symptomatology was unrelated to gender. In middle childhood more lower SES children than expected fell within the elevated category and fewer higher SES children than expected fell within the elevated category. Elevated

internalizing symptomatology, as measured by teacher ratings, was associated with weaker academic skills and less social/behavioral competence at all three points in time. Elevated internalizing symptomatology was also associated with heightened internalizing and externalizing symptomatology, as measured by children's self-report, in middle childhood. Elevated internalizing symptomatology was negatively associated with social self-concept, but not academic self-concept. Teacher-rated elevated internalizing symptomatology was very unstable from early to middle childhood, and only slightly more stable within the middle childhood years. Kindergarten internalizing symptoms were not predictive of later self-concept and competency. The impact of selected socio-cultural factors (i.e., gender, race/ethnicity, SES) on temporal relationships was not significant. Results are discussed with regard to future directions for research and implications for practice.

THE RELATIONSHIPS AMONG INTERNALIZING SYMPTOMATOLOGY IN
KINDERGARTEN AND LATER SELF-CONCEPT AND COMPETENCE

By

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Chapter 1: Introduction

Self-Concept

Self-concept has long been of interest to theorists in the fields of human development, personality, and psychology. The construct is of interest to clinicians and educators as well, as it has been shown to be associated with children's mental health outcomes and school success. A large body of research documents the relationships between students' self-perceptions and school success (for review, see Byrne, 1996). Longitudinal studies have shown that self-concept predicts later achievement, even when controlling for earlier achievement (Stipek & MacIver, 1989; Wigfield et al., 1997). In addition, research on resilience in children has identified self-concept as a protective factor. Positive self-concept (self-esteem) is associated with more social skills, higher academic achievement, and fewer internalizing problems (Atkins-Burnett & Meisels, 2001).

Middle childhood is a critical time in the development of self-concept. Prior to middle childhood, young children's self-perceptions are almost uniformly high. Individual differences begin to emerge in middle childhood, as children's developing cognitive abilities allow them to hold a more complex view of themselves and others. Increasing cognitive capabilities, along with the social environment of school, allow children to use social comparison to make inferences about their own competence. By the time children leave elementary school, their self-concept is relatively more stable, more differentiated, and more realistic than the one with which they entered. Given the formative changes occurring during this period, it may be particularly vulnerable to disruptions to the development of healthy self-concept.

Internalizing Disorders

One possible source of disruption is the presence of internalizing disorders. Internalizing disorders are characterized by symptoms of depression, anxiety, somatization, and withdrawal. They are already present in the population at the time of school-entry, with recent research documenting the presence of anxiety disorders and depression as early as preschool (Meagher, Arnold, Doctoroff, Dobbs, & Fisher, 2009; Mesman, Bongers, & Koot, 2001). Depression and anxiety disorders are present in the school-age childhood population at rates of 2-3% and 13%, respectively (National Alliance on Mental Illness [NAMI], 2009). While internalizing disorders frequently co-occur with externalizing behaviors (i.e., conduct problems, aggression, under-regulation), they are less likely to be the focus of intervention.

Self-perceptions have long been viewed as integral to the development and maintenance of internalizing disorders. Cognitive theories of depression, in particular, posit causal relationships between individuals' self-perceptions (i.e., self-worth, perceptions of competence) and depressive symptomatology. Studies from a diverse set of research domains have documented the association between depression and negative self-perceptions in children (Cole, 1990; Harter, Marold, & Whitesell, 1992). Recent studies have suggested that the presence of depression may cause negative bias and, subsequently, low self-concept (e.g., Cole, Martin, Peeke, Seroczynski, & Hoffman, 1998; McGrath & Repetti, 2002).

Statement of Purpose

The present study explored the relationships among internalizing disorder symptoms, academic/social skills, and self-concept. Family and school variables (e.g.,

parental support, family structure, classroom characteristics, etc.), while recognized as important, are beyond the scope of the study. The use of the ECLS-K dataset in the current study is broadly consistent with the stated goals of the larger ECLS-K study. The manual states that the ECLS-K, “. . .provides a rich dataset that enables researchers to analyze how a wide range of family, school, community, and individual variables affect children’s early success in school . . .” (Tourangeau et al., 2009 pg. 1-4). After careful review, study designers selected social-emotional measures with strong psychometric characteristics and close alignment with these goals. Please see the working paper published by the National Center for Education Statistics for a discussion of the rationale for inclusion of a modified version of the Social Skills Rating Scale (U.S. Department of Education, 1996).

The current study examines a subset of children who present with elevated levels of internalizing disorder symptoms, as rated by teachers, in kindergarten. Data from the ECLS-K are used to describe characteristics of these children in kindergarten, examine the stability of these symptoms during elementary school, and explore relationships between early internalizing symptoms and later self-concept and competency.

A developmental pathway in which the relationship between kindergarten internalizing symptomatology and later competency is mediated by self-concept was proposed. Kindergarteners exhibiting internalizing symptomatology might be prone to the cognitive vulnerabilities associated with depression and anxiety. It was posited, then, that this characteristic is associated with the development of negative self-concept. Some support for this pathway has been documented in recent studies in the developmental psychopathology literature (Cole et al., 1998; McGrath & Repetti, 2002). These studies,

however, were specific to depression, examined older children, and covered shorter periods of time (three years). No known previous studies have sought to identify characteristics present in kindergarten as distal correlates of negative self-concept three to five years later.

It was further posited that this cognitive vulnerability, should it exist, may be particularly relevant for children with weaker school readiness skills, for whom the first years of school might be more stressful. Strong academic and social skills would be expected to relate to positive self-concept and may serve as a protective factor against cognitive vulnerabilities. Longitudinal analyses tested whether kindergarten academic competencies moderated the relationship between kindergarten internalizing symptomatology and later self-concept.

Previous longitudinal studies have tended to follow children for shorter periods of time (e.g., two to three years) and to rely heavily on self-report measures to assess internalizing behavior symptoms. The present study explores this trajectory over a longer time-span (i.e., up to five years) and uses multiple sources of information. It is also important to note that the degree of internalizing symptoms was first assessed at an age when children have developed only a rudimentary, and almost universally positive, self-concept. It is unlikely, then, that the symptoms present at that time are the result of negative self-concept.

Research Questions

Questions 1 and 2 sought to identify and describe correlates of elevated internalizing symptomatology, as rated by teachers. Questions 3 through 8 are longitudinal in nature and tested specific hypotheses regarding stability of internalizing

symptomatology over time and relationships between kindergarten internalizing symptomatology, as rated by teachers, and later functioning. Supplemental analyses were conducted to explore the relationships among race/ethnicity, gender, and SES.

Question 1. What are the characteristics of children who present with teacher rated elevated internalizing symptomatology in kindergarten? Do they differ from children with typical levels of internalizing symptomatology with regard to gender, race/ethnicity, SES, early academic skills, and school behavior?

Question 2. Are the relationships among variables identified in Question 1 (kindergarten) also present at Time 2 (K+3) and Time 3 (K+5)?

Question 3. Is teacher-rated high internalizing symptomatology in kindergarten indicative of a stable characteristic that persists over time? Do children with this characteristic in kindergarten continue to evidence this characteristic three years and five years later? The present study tested the hypothesis that children with elevated internalizing symptomatology in kindergarten would continue to evidence this characteristic three and five years later.

Question 4. Is elevated symptomatology stable over a two-year period in middle childhood? Do children with elevated internalizing symptomatology in third grade continue to evidence this characteristic two years later? The present study tested the hypothesis that children with elevated internalizing symptomatology in third grade would continue to evidence this characteristic two years later.

Question 5. What are the relationships among internalizing symptomatology in kindergarten and later academic and social competence? The present study tested the hypothesis that elevated internalizing symptomatology in kindergarten predicts:

5a. domain specific competency three years later, even when controlling for gender and concurrent internalizing symptomatology.

5b. domain specific competency five years later, even when controlling for gender and concurrent internalizing symptomatology.

Question 6. What are the relationships among teacher reported internalizing symptomatology in kindergarten and later academic and social self-concept? The present study tested the hypothesis that elevated internalizing symptomatology in kindergarten predicts:

6a. domain specific self-concept three years later, even when controlling for gender and concurrent internalizing symptomatology.

6b. domain specific self-concept five years later, even when controlling for gender and concurrent internalizing symptomatology.

Question 7. To what extent are the relationships between teacher reported elevated internalizing symptomatology in kindergarten and later domain specific competency (reading, math, social) mediated by domain specific self-concept? The present study tested the hypothesis that the relationship between elevated internalizing symptomatology in kindergarten and domain specific competency:

7a. three years later is mediated by domain specific self-concept.

7b. five years later is mediated by domain specific self-concept.

Question 8. To what degree does domain specific competency (reading, math, social) in kindergarten serve to moderate the relationship between internalizing symptoms in kindergarten and later domain specific self-concept? The present study tested the

hypothesis that domain specific competency in kindergarten serves to moderate the relationship between:

8a. elevated internalizing symptomatology in kindergarten and domain specific self-concept three years later.

8b. elevated internalizing symptomatology in kindergarten and domain specific self-concept five years later.

Definition of Terms

The following is a list of the key constructs as defined in the current study.

Academic Competence: the possession of skills necessary to be successful in academic subjects. The current study assessed the domains of reading/language arts competence and math competence separately using teacher ratings and performance on direct measures.

Academic Self-Concept: an individual's self-perception of their competence in academic subjects. The current study assessed the two domains, reading/language arts and math separately.

Externalizing Symptomatology: a constellation of outwardly-focused and disruptive social-emotional difficulties that includes feelings of anger, aggression, and impulsive behaviors. The current study used teacher ratings and self-report to assess externalizing symptomatology.

Internalizing Symptomatology: a broad category of social-emotional difficulties that includes symptoms of anxiety, depression, somatic complaints, and social withdrawal.

The current study used teacher ratings and self-report to assess internalizing symptomatology. The construct was dichotomized in the current study as:

Elevated Internalizing Symptomatology: Individuals scoring at or above two standard deviations above the sample mean on a teacher rating scale of internalizing behaviors were classified as displaying elevated internalizing symptomatology.

Typical Internalizing Symptomatology: Individuals with scores less than two standard deviations above the sample mean on a teacher rating scale of internalizing behaviors were classified as displaying typical internalizing symptomatology.

Social Competence: the possession of social, emotional, and cognitive skills necessary to be successful in interpersonal interactions.

Social Self-Concept: an individual's perception of others' acceptance or liking of them (i.e., social acceptance).

Chapter 2: Review of the Literature

Historical Perspectives and Current Frameworks of Self-Concept

Self-concept was one of the earliest constructs examined in the field of psychology. Influential early theorists including, William James in the late 19th century and Charles Cooley and George Mead in the early 20th, considered self-concept worthy of study. The following section reviews the main contributions of these theorists and highlights their relevance to current models of self-concept and self-concept research.

Early Theorists

The work of James (as described in Harter, 1998) anticipates many of the issues studied by current self-concept researchers. He posited four major characteristics regarding individuals' cognitive construction of themselves. First, James distinguished between two fundamental aspects of the self, the "I-self" and the "Me-self". The I-self, or self-as-knower, is the active agent that subjectively organizes and categorizes one's experiences. In contrast, the Me-self, or self-as-object, is the total sum of one's experience of one's self. It is this Me-self that has come to be termed self-concept in the literature (Harter, 1996) and that is the focus of this study. Virtually all current conceptualizations of the self include this distinction (Marsh & Hattie, 1996).

A second characteristic identified by James is the division of the Me-self into three parts, the material self, the social self, and the spiritual self. The material self is concerned with the view of one's body and physical characteristics, the social self concerns others' views or opinions of one's self, and the spiritual self concerns one's thoughts and morals. James believed that these multiple selves were hierarchically organized (i.e., material self at the bottom and spiritual self at the top). Current theorists

(Bracken, 1992; Harter, 2006; Marsh & Shavelson, 1985) maintain that self-concept is multidimensional and hierarchical, and their measures reflect this distinction. Both the scales developed by Harter and by Marsh and his colleagues measure a number of content-specific domains of self-concept (academic, non-academic, etc.) as well as the separate domain of self-esteem (Harter's "global self-concept", Marsh's "general self"). While researchers agree, in general, with James's hierarchical nature of the self-concept, there is a lack of agreement regarding the specific structure (Manning, Bear, & Minke, 2006) and the hierarchy is not as strong as originally predicted by the Shavelson, Hubner, and Stanton model (Marsh & Craven, 2006).

The third characteristic posited by James is the existence of multiple social selves. In acknowledging the role that context plays in creation of one's sense of self, he proposes that individuals carry with them a multiplicity of social selves. He describes how different, at times contradictory, selves may be manifested in interactions with different people. The importance of feedback from others in the creation of the social self was further emphasized in the work of the symbolic interactionists, discussed in the next section, and continues to be a defining characteristic of current theoretical models (Harter, 1996, Marsh & Hattie, 1996).

The final characteristic identified by James is that success in the domains deemed important to the individual are predictive of an overall sense of self-worth or self-esteem. When individuals regard themselves as successful in domains they deem important, they will experience high self-esteem. Likewise, when individuals regard themselves as unsuccessful in domains deemed important, they will experience low self-esteem. In contrast, the experience of success or failure in domains considered unimportant by an

individual will have minimal effect on overall self-esteem. This characteristic is integral to the framework held by Harter and colleagues (Harter, 1999). Other theorists, while acknowledging the validity of this characteristic, do not include it in their empirical studies or in the construction of their scales (Bracken, 1992; Marsh, 1985).

In summary, James's early theorizing identified four major characteristics of self-concept still relevant to current models: (a) the distinction between the I-self and Me-self, (b) self-concept's multidimensional and hierarchical nature, (c) the influence of the social context on multiple selves, and (d) the impact of the relative importance of various domains on an individual's overall self-worth.

Another early influence guiding modern theory is the work of the symbolic interactionists, namely, Cooley and Mead. The conceptualizations put forth by both theorists hold the interactions individuals have with others of paramount importance in the development of self-concept. Cooley's description of the "looking-glass-self" posits that the responses of others serve as a mirror into which the individual looks to gain information about one's self (as cited in Harter, 1998). An individual looks to others' actions to interpret how they feel about him or her. Over time, the individual internalizes the appraisals of others and they become his or her own thoughts and feelings about him or herself. Cooley also emphasized the importance of the individual's affective response to the appraisals of others in the development of self-concept.

Mead's formulations shared with Cooley the centrality of social interactions to self-concept development (as cited in Harter, 1998). Mead further specified that it is the composite of all the interactions among an individual and others that becomes internalized. He described a "generalized other" whose opinion and appraisal of the

individual comes to serve as the individual's own self-concept. The work of the symbolic interactionists continues to influence conceptualizations of self-concept to this day.

Current Conceptualization of the Self-Concept Construct

While early theorists were quite precise in specifying the characteristics and formulation of self-concept, much of the empirical work conducted later in the twentieth century lacked this conceptual clarity. One cause of this predicament was that most researchers were interested in studying self-concept as an outcome variable or how the construct related to other variables. Measures were then created to test this variable without taking into account construct validity. This has been attributed, in part, to the emergence of behaviorism and its emphasis on the study of observable behaviors (Harter, 1996).

In their 1976 review, Shavelson, Hubner, and Stanton decried the state of self-concept research and called for a unified definition of the construct. The paper has had a substantial and long-lasting influence on subsequent research aimed at understanding the structure of self-concept and establishing construct validity (Harter, 1998; Marsh & Hattie, 1996).

Shavelson et al. (1976) noted the importance of the self-concept construct to educational research whether studied as an outcome variable or as a moderator of other variables (e.g., achievement). They claimed that while there was much interest in studying the construct, the lack of a clear definition and the imprecision of instruments with which it was measured limited the utility of self-concept research up to that time. These problems undermined the confidence with which results could be interpreted. To address this concern, Shavelson et al. proposed that future self-concept research be

grounded in theory and employ careful methodology in order to establish construct validity. They highlighted the importance of identifying both within-network characteristics (i.e., those related to the structure and make-up of self-concept) and between-network characteristics (i.e., relating self-concept to other constructs).

The current state of the field is much improved and there is reason for optimism (Bear, Minke, & Manning, 2002; Harter, 1996; Strein, 1993). The measures used by the dominant researchers in the field today (Harter's Self-Perception Profiles and Marsh's Self-Description Questionnaires) are grounded in sound theory and are empirically and psychometrically valid (Bear, et al., 2002). Both the Self Perception Profiles, developed by Harter, and the Self-Description Questionnaires, developed by Marsh and colleagues, were derived from specific and well-defined theoretical models. Subsequent empirical research has led to the support and refinement of these models. As Marsh and Craven (2006) describe the process, "theory building and instrument construction are inexorably intertwined" (p. 136).

Marsh & Shavelson Revised Model

In their 1976 article, Shavelson et al. specified the following seven characteristics of self-concept: (a) organized, (b) multifaceted, (c) hierarchical, (d) stable, (e) developmental, (f) evaluative, and (g) differentiable. While most of these characteristics had long been implicitly understood by theorists, the measures most commonly used in research up to this time were not guided by theory. For example, while theorists since James had described self-concept as having more than one facet, most measures of self-concept provided only a global score. An important contribution of the Shavelson et al. article, then, was to serve as an impetus in the development of instruments designed to

measure multidimensional self-concept. Marsh notes that the original schematic diagram included in the article was never intended to serve as *the* model of self-concept, but as one possible representation. As it was grounded in theory and a comprehensive review of the research, however, it was deemed a reasonable model to test. In fact, Marsh & Shavelson (1985) designed the Self-Description Questionnaire (SDQ) specifically to test this model. The basic structure of the representation presented in the Shavelson et al. article has held up well to rigorous empirical study, even with the development of powerful statistical techniques developed later.

The original model tested by Marsh and colleagues posited a hierarchical organization with general self-concept at its apex. This general self-concept is comprised of two components: academic self-concept and nonacademic self-concept. Academic self-concept was then comprised of multiple lower-order facets, including reading, math, and other subjects. Nonacademic self-concept is comprised of social and physical self-concepts which each include additional, lower-order facets. The revised model retains most of the structural characteristics present in the original, with the exception of the factor structure of academic self-concept (Marsh & Shavelson, 1985). Although the original model posited that math self-concept and verbal self-concept would be correlated and fall under a general factor of academic self-concept, this was not supported by subsequent research with the SDQ. As verbal-academic self-concept and math-academic are uncorrelated, a better model has three second-order factors (nonacademic, verbal-academic, and math-academic). In fact, additional studies suggest that achievement in one academic domain (for example, math) is associated with higher self-concept in the same domain (math), but with lower self-concept in the other academic domain (verbal)

(Marsh & Craven, 2006). Marsh and Craven's reciprocal effects model (REM), discussed later, attempts to explain this discrepancy.

The field has not universally adopted the Shavelson et al., 1976 and Marsh & Shavelson (1985) models of self-concept. Several other models, which also incorporate the multifaceted nature of self-concept, have received extensive empirical support and are widely used in current research (Bracken, 1992; Harter & Pike, 1984). While Harter acknowledges statistical support for the hierarchical structure outlined by Marsh and Shavelson, she has questioned whether it accurately reflects the psychological structure of the self. She maintains that there is little evidence that people actually organize their self-perceptions in this manner (Harter, 1998).

Self-Concept in Early and Middle Childhood

There is a large body of research that describes the development of self-concept across the lifespan. Understanding the normative developmental progression of self-concept adds to the understanding of the underlying structure and function of the construct itself. The developmental stage of primary focus in the proposed study, Middle Childhood, is of particular interest as it is when the defining characteristics of the construct first emerge.

While global, or general, self-worth does not develop until middle childhood (Harter 1998), younger children do engage in self-evaluations and a rudimentary self-concept can be assessed through behavioral observations and ratings by adults. Young children (before the age of seven) can describe characteristics of themselves (e.g., I run fast. I know my ABCs, etc.), but do not describe themselves using trait-like descriptors. Recent research with four- and five-year olds suggests that, with appropriate measures,

even very young children may be capable of differentiating among multiple domains of self-concept (Marsh, Ellis, & Craven, 2002). It is only in middle childhood, however, that children acquire the cognitive and linguistic capabilities to formulate and express a sense of general self-worth (Harter, 1998).

Young children's self-evaluations are almost uniformly high and without the individual differences that emerge in middle childhood. Young children engage in wishful/magical thinking with no discrepancy between their ideal selves and real selves. For them, wishing makes it so. When children develop the cognitive capability to realize that just because they want something to be, it does not necessarily happen, the ideal/real discrepancy is possible. The emergence of more sophisticated cognitive reasoning in middle childhood, including the ability to integrate both positive and negative concepts about oneself and to group specific behavior to form traits, allows for a more mature self-concept to emerge. The large body of research using the SDQ-I documents increasing differentiation of self-concept from second to sixth grades. While the hierarchical structure of self-concept is stable, the factors become less correlated with age (Marsh, 1989). In addition, the ability to integrate global self-worth, how one feels about one's self in a general sense, can be reliably assessed for the first time (Harter, 1998).

By middle childhood, individual differences begin to emerge in children's domain-specific self-concepts and self-esteem/general self-worth. Children's ability to take into account external feedback and their emerging capacity for social comparison leads to more realistic self-appraisals (Marsh, 1989). School is a powerful socializing agent and a strong influence on children's views of themselves. Harter (1998) notes that by this age, most children are sufficiently socialized to value the importance of success in

the areas of attractiveness, academic and social competence, and behavioral performance. Also, at this age children recognize that they are being evaluated by others and evaluations by peers are extremely important to them (Rubin, Bukowski, & Parker, 2006). Compared with early childhood, children's ratings of self-concept become more consistent with real performance and the ratings of others. By middle childhood, children make use of social comparison to assess personal competence (Ruble & Frey, 1991).

These developmental changes contribute to the well-documented decline in self-evaluations from early to middle childhood (Harter, 1998). This is not to say that, as a group, children in middle childhood do not feel positively about themselves, merely that the almost universal positive bias present in early childhood is gone. This trend continues through adolescence. In the past, most studies of developmental changes in self-concept relied upon cross-sectional methodology. In the last 10 years, however, several methodologically strong longitudinal studies have lent even more support to previous findings and have identified important developmental trends in self-concept and perceived competence (for example: Cole et al., 1998; Jacobs et al., 2002; Marsh, Craven, and Debus, 1998; Wigfield et al., 1997). Using a cross-sequential design, Jacobs et al. (2002) looked at longitudinal changes in self-competency and task values over grades one through twelve. A downward trend was observed in self-competence beliefs in language arts, math, and sports across all grades and for both genders. Similar results were documented by Marsh et al. and Wigfield et al. Cole et al. caution, however, that when measured with more frequency (every 6 months) this trend may not be linear. In their study, they used a cohort-sequential longitudinal design to assess changes in the structure of self-concept over time. Results largely supported their prediction that periods

of decline were interspersed with periods of stability, or even increases, in children's self-concept.

Gender differences in domain-specific self-concept are also present in middle childhood and are consistent with gender stereotypes (Harter, 1998; Marsh, Craven & Debus, 1998). For example, boys are more positive about their abilities in math and sports, and girls are more positive about their abilities in reading and instrumental music (Wigfield et al., 1997). A recent study by Jacobs et al. (2002) found that gender differences do not increase with age, as might be expected given social influences, but either remain stable (reading, verbal) or decrease (math) into adolescence.

In summary, over the course of middle childhood, children's self-concept becomes more differentiated, more stable, more consistent with actual performance, and less positively biased. The recognizable hierarchical and multifaceted structure of self-concept emerges. Gender differences reflect gender stereotypes and persist into adolescence.

Self-Concept and School Adjustment

While Academic Self-Concept and Social Self-Concept are two separate constructs, both are associated with important facets of school adjustment. The following sections review the wealth of empirical support for each construct and the relationships among each with school achievement and social competencies.

Academic Self-Concept

Academic self-concept is defined as an individual's self-perception of his or her competence with academic subjects. It most commonly refers to both descriptive and evaluative components of self-perception (Strein, 1993; Swann, Chang-Schneider, &

Larsen McClarty, 2007). The moderately positive relationship between academic self-concept and achievement, particularly within specific domains (reading, math, etc.), is long established (Byrne, 1996). That is, domain-specific academic self-concept (i.e., math vs. English) is correlated with academic performance in the same domain (Byrne, 1996; Harter, 1998; Wigfield et al., 1997). Domain specific gender differences in academic self-concept are present by the early elementary grades and are stable or may actually decrease over time (Marsh & Yeung, 1998; Wigfield et al., 1997; Jacobs et al., 2002).

Normative Changes in Academic Self-Concept

As is true with other domains of self-concept, older children's self-perceptions of academic competence are more strongly correlated with teachers' and parents' assessment of performance than are younger children's (Marsh, 1993). Achievement related beliefs become established in middle childhood and are stable over one year (Wigfield et al., 1997). Prior self-perceptions are the strongest predictors of perceptions one year later (Obach, 2003; Eccles et al, 1989). Both cross-sectional and longitudinal studies have shown an overall decline with age in academic self-concept across domains (Marsh, 1990; Wigfield et al, 1997; Jacobs et al., 2002).

Several studies have documented a decline in academic self-concept corresponding to the transition from elementary to middle school (Wigfield et al., 1991), however, when school transition effects are controlled for, grade-level differences are not found (Obach, 2003). In fact, for most students, after the transition to middle school is adapted to, academic self-perception appears to rebound. (Murdock, Anderman & Hodge, 2000).

Frame of Reference Effects on Academic Self-Concept

There is significant empirical support for the multidimensionality of academic self-concept (Byrne, 1996; Marsh & Craven, 2006). In particular, Math and English self-concept are almost completely uncorrelated, even though Math and English achievement is substantially correlated. These findings were somewhat problematic for hierarchical models (e.g., Shavelson et al., 1976) that posited that Math and English self-concepts are subsumed by a higher-order factor (i.e., academic self-concept). The subsequent revision of the Marsh/Shavelson model contains two academic factors: verbal/academic and math/academic (Marsh, Byrne, & Shavelson, 1988). The Internal/External (I/E) frame of reference model was proposed by Marsh to explain these findings and has since gained significant empirical support (Marsh & Craven, 1997; Marsh and Hau, 2004).

The I/E model posits that academic self-concepts, specifically math and verbal, are influenced by both internal and external comparisons. External comparisons involve individuals comparing their performance, or self-perceived ability, to that of other group members. For example, a child might look at how her classmates perform in reading relative to her own reading performance to make judgments about her own reading ability. In contrast, internal comparisons involve individuals comparing their performance in one domain with that of another. For example, a child might look at his reading performance relative to his math performance to make judgments about his ability in each domain.

When considering this model, it is clear that accurate perceptions (or slightly positively biased) of one's skills and performance are imperative to the development of a healthy self-concept. Child development research has examined environmental

characteristics that might impact a child's perceptions. For example, research examining the Big Fish Little Pond Effect (BFLPE; Marsh & Packer, 1984) has identified characteristics of an individual's peer group or institution that impact self-concept. In contrast, the developmental psychopathology literature, described in a later section, has focused more on the impact of individual characteristics.

Longitudinal Studies and Causal Ordering

One of the most popular lines of research involving academic self-concept concerns the question of causal dominance of achievement and self-concept. With the advent of sophisticated statistical techniques (e.g., SEM), the question of causality can be addressed with more confidence. In the past decade a significant body of research, using primarily the various SDQ measures, has consistently demonstrated that the effects are, in fact reciprocal. Marsh's Reciprocal Effects Model (REM; 1990) explains that, while prior academic achievement affects subsequent academic self-concept, so does prior academic self-concept affect subsequent academic achievement. Recent research provides substantial support for REM (Marsh & Craven, 2006). A meta-analysis conducted by Valentine, DuBois, & Cooper (2004) found that academic self-concept and academic achievement had reciprocal effects, as expected by the REM. Notably, this relationship is not present between general self-concept (i.e., self-esteem) and academic achievement.

The REM has significant implications for intervention development, particularly in the classroom setting. Marsh and Craven (2006) propose that practitioners should seek to improve self-concept and achievement simultaneously and to target interventions to specific component or domains.

Together, the I/E model and the REM model provide a satisfying explanation of normal self-concept development. They do not, however, directly address the exceptions to normal development, such as when children with adequate academic skills relative to their peers report poor academic self-concept. The proposed study seeks to formulate questions regarding these exceptions informed by sound theory of self-concept development.

Social Self-Concept

Historically, there have been two ways in which the construct of social self-concept has been described (Berndt & Burgoyne, 1996). First, social self-concept can refer to a person's self-perception of his or her social skills. Relatively few measures (e.g., Tennessee Self-Concept scale) of social self-concept have operationalized the construct in this manner. The second way in which social self-concept is often defined refers to a person's perception of others' acceptance or liking of them (i.e., social acceptance). This definition is consistent with the way in which social self-concept was described by early theorists, such as James and Cooley, and is assessed by the social self-concept scales of the more popular measures currently used in research (e.g., Harter's SPPC and Marsh's SDQI).

The proposed study considers the social acceptance definition of social self-concept. The items which comprise the Peer Relationships scale of the SDQI, items from which are adapted for use in the ECLS-K, measures a specific type of social acceptance-acceptance by peers. The items on the Peer Relationships subscale assess self-perceptions of friendship, liking, and popularity.

Children's social self-concept and physical self-concept are strongly related. That is, children who view themselves as more accepted by peers also view themselves as more competent athletically and more physically attractive. There is some evidence that these perceptions are accurate, as studies have found that children with popular status are often rated by others as more attractive and having more athletic ability than do unpopular children (Berndt & Burgoyne, 1996). In contrast, the relationship between social self-concept and academic self-concept is not as strong, with correlations typically falling between .30 to .40 (Harter, 1998; Berndt & Burgoyne, 1996).

Social Self-Concept and Indicators of School Adjustment

While a moderate relationship exists between social and academic self-concept, social self-concept appears to be unrelated to actual academic performance. Non-academic self-concept, including social self-concept, is not significantly related to academic achievement as measured by achievement tests or teacher ratings (Marsh, 1990). In addition, several studies have shown no difference between the social self-concept of LD/underperforming students and typically achieving students (Clever, Bear, & Junzoven, 1992; Bear, Minke, & Manning, 2002). Similarly, a meta-analysis performed by Hoge & Renzulli (1993) found that social self-concept was the same for average and gifted students.

Although a direct association between social self-concept and academic achievement has not been documented, several components of school adjustment (e.g., peer relationships, behavior problems, etc.) are associated with social self-concept. As such, social self-concept should not be neglected when seeking to maximize educational outcomes.

Flook, Repetti, and Ullman (2005) examined the relationships among peer acceptance, self-concept, academic performance, and internalizing symptoms during late elementary school by following 248 children from 4th to 6th grade. Peer acceptance and internalizing symptoms were rated by teachers, academic performance was assessed by report card grades, and children completed self-report measures of academic self-concept. The authors posited an indirect relationship between peer acceptance and academic performance, mediated by self-concept and internalizing symptoms. Path analysis supported this model. Specifically, a lack of peer acceptance in 4th grade predicted lower self-concept and more internalizing symptoms in 5th grade, which then predicted lower academic performance in 6th grade. These findings were the same for both genders. This study highlights the importance of positive peer relationships to academic success and the need for interventions to support social and emotional functioning in the school setting.

Another study investigating social self-concept and depression found that peer acceptance is a direct correlate of depressive symptoms and a mediator between peer dislike and depression. Zimmer-Bembeck, Hunter, and Pronk (2007) looked at the relationships among social behaviors, peer problems, self-perceptions of social acceptance, and depressive symptoms for 377 9- to 13-year-olds. The strongest predictor of depressive symptoms was self-perceived peer acceptance. Interestingly, students who underestimated their peer acceptance were just as likely as students with actual low acceptance to be depressed.

Self-Concept and Internalizing Behavior Disorders

Internalizing Behavior Disorders

Internalizing behavior disorders are characterized by a set of symptoms that includes anxiety, depression, somatic complaints, and withdrawal. The most prevalent internalizing disorders are depression, of which there are three specific DSM-IV diagnoses applicable to children, and anxiety disorders, of which there are more than ten (Kovacs & Devlin, 1998). Children diagnosed with a mood or anxiety disorder are at significant risk for recurrence. A longitudinal study that followed 55 clinic-referred children for an average of 6.5 years found that 81% of children initially diagnosed with dysthymic disorder experienced a depressive episode within the following six years. Fifty percent had developed an anxiety disorder and 40 %, a conduct disorder. (Kovacs et al., 1994; as cited in Kovacs & Devlin, 1998). While internalizing disorders are often contrasted with externalizing disorders, a high degree of comorbidity exists among the two (McConaughy & Skiba, 1993). Gender differences in the prevalence of internalizing disorders are not present before adolescence, at which time the risk for females increases substantially (Meagher, Arnold, Doctoroff, Dobbs, & Fisher, 2009; Twenge & Nolen-Hoeksema, 2002).

Much of the research regarding self-concept and developmental psychopathology has focused specifically on the internalizing disorder of depression, as negative self-perceptions are considered integral in cognitive theories of depression. This body of research is discussed separately in the next section.

Depression and Self-Concept

Depressed children hold negative views of their academic and social competence (Cole et al., 1999; Hammen & Rudolph, 1996). Furthermore, there is evidence that low self-concept in multiple domains (e.g., social and academic) is associated with more

symptoms of depression than low self-concept in any one domain (Seroczynski, Cole, & Maxwell, 1997). That is, the severity of depressed mood was positively related to the number of domains in which a child reports low self-concept. Conversely, positive self-concept in any one domain was associated with fewer depressive symptoms. Cognitive theories of depression have traditionally held that negative self-perceptions lead to depressed mood. Recent research, however, has questioned this presumed causal relationship in children.

Constructs of interest to this line of research include: perceptions of competence, cognitive distortions (operationalized as the discrepancy between self- and others' perceptions of competence), and self-report of depressive symptoms. Cole's (1991) competence model of depression has been investigated in numerous studies (Cole, Martin, Peeke, Seroczynski, & Fier, 1999; Hoffman, Cole, Martin, Tram, & Seroczynski, 2000; to name a few).

The study by Cole et al. (1999) followed a total of 807 third and sixth graders over three years. Every six months, participants completed self-report measures of academic competence, symptoms of anxiety, and feelings of depression. Children's ratings were compared with "objective" ratings of academic competence provided by their teachers to examine accuracy (as opposed to under- or overestimation) of self-perceptions. Symptoms of depression and anxiety predicted the presence of underestimation at a later time. In contrast, errors of underestimation did not predict changes in depressive symptoms. Based on these findings, Cole et al. suggest that underestimation of academic competence is a consequence of depression/anxiety. Furthermore, the relationship between anxiety/depressive symptoms and underestimation

of competence was the same for both genders, suggesting the same mechanisms are present for boys and for girls. Interestingly, overestimation of self-concept emerged as a protective factor. That is, children who overestimated their academic competence reported less depressive symptoms at a later time. Boys were much more likely to overestimate their competence than girls. Perhaps this foreshadows the increased rates of depression for girls in adolescence. The degree to which the Cole et al. study's results were impacted by some children's predisposition to respond in socially-desirable ways is unclear. Supplementing self-report measures of depressive symptoms with reports from others' may have addressed this concern.

Hoffman, Cole, Martin, Tram, and Seroczynski (2000) explored whether discrepancies between self- and other- ratings of competence were predictive or reflective of depressive symptoms. Hoffman et al. followed two cohorts (360 students total) of non-referred children over the course of two years. Depressive symptoms and self-perceptions were assessed by self-report. Teacher ratings of children's competencies and parent ratings of children's depressive symptoms were also obtained. As expected, symptoms of depression were correlated with negative self-perceptions. This was true for both discrepant and reflective (i.e., accurate) appraisals. Negative self-perceptions, whether accurate or not, are both cause and consequence of symptoms of depression. Longitudinal analyses showed that depressive symptoms did predict discrepant self-appraisals, but not reflective ones, suggesting that an episode of depression can serve as precursor to biased self-perceptions.

McGrath & Repetti (2002) also set out to explicitly test the direction of causality between self-perceptions and depressive symptoms. They tested whether negative self-

perceptions (academic, social, global) predicted depressive symptomatology or whether the reverse (i.e., depressive symptomatology precedes negative self-perceptions) was true. Two hundred twenty seven non-referred children were followed from 4th to 6th grade. The sample was predominantly white and upper middle-class. To assess cognitive distortion (i.e., underestimation of competence), children's self-perceptions of social acceptance were compared with teacher ratings of social acceptance and children's self-perceptions of academic competence were compared with report card grades. Results revealed that depressive symptoms predicted increases in cognitive distortions and negative self-perceptions across all domains. This finding suggests that even mild depressive symptoms (i.e., at levels found in a non-referred sample) impact the accuracy with which children interpret and internalize social information about their competence. To determine whether behavior problems in general would have the same impact on self-concept development, McGrath & Repetti included level of externalizing behavior in all analyses. The presence of externalizing behaviors did not change results, suggesting that depressive symptoms, not general problems with functioning, are responsible for negative self-perceptions.

Contribution of the Current Study

The body of research described above provides persuasive evidence that underestimation of academic and social self-concept is predicted by prior depressive, perhaps internalizing, symptoms. While the reverse (i.e., poor self-concept leads to depression) is more consistent with cognitive theories of depression, support in childhood is mixed. This line of research is directly related to our understanding of self-concept in children and important to intervention development. Traditionally, interventions to

bolster self-concept (often conceptualized as general self-esteem) focused directly on making students' self-perceptions more positive. It may be prudent, however, to consider individuals' underlying negative mood states and/or predisposition to cognitive biases as primary targets for intervention.

The current study seeks to contribute to the literature on self-concept and internalizing behaviors in children by investigating the relationships among them over time and with a large, diverse, and nationally representative sample. Self-concept is conceptualized as multifaceted, consistent with empirically supported theory, and is measured with a psychometrically sound instrument. Much prior research has relied exclusively on self-report measures to assess internalizing behaviors (e.g., self-report scales of depressive symptoms). The current study supplements self-report data with ratings from teachers.

Due to the correlational nature of the analyses, causality cannot be addressed. Longitudinal data, however, allow investigation of the temporal relationship between early internalizing behavior symptoms and later self-concept. A unique characteristic of the current study is the early age of initial data collection (i.e., school entry). This provides an assessment of the presence of internalizing behaviors at school entry, while self-concept is almost uniformly high and before school performance would affect it.

Chapter 3: Method

Participants

The current study analyzed data from the Early Childhood Longitudinal Study-Kindergarten cohort (ECLS-K), a multi-year, longitudinal study supported by the National Center for Educational Statistics (NCES) (U.S. Department of Education, National Center for Education Statistics, 2006). The ECLS-K samples a diverse set of children from nationally-representative ethnic, racial, and socio-economic backgrounds. The ECLS-K collected data at seven points in time: fall and spring of kindergarten (rounds one and two), fall and spring of first grade (rounds three and four), spring of third grade (round five), spring of fifth grade (round six), and spring of eighth grade (round seven). The proposed study will analyze data collected during the spring of students' kindergarten (Time 1), third (Time 2), and fifth grade (Time 3) school years.

Data from the 9,160 participants who were first-time kindergarteners during the base year, and for whom at least partial data was available at Time 2 and/or Time 3, were included in the present study. This sample is comprised of a roughly equivalent number of girls ($n = 4572$, 49.9%) and boys ($n=4588$, 50.1%). The race/ethnicity of the participants is the following: 59.3% were White nonhispanic, 18.4% were Hispanic, 14.9% were Black or African American nonhispanic, 2.4% were Asian, 1.7% were American Indian or Alaskan Native, .5% were Native Hawaiian or other pacific islander, and 2.6% of respondents reported more than one race/ethnicity. While the number of participants is much fewer, the current study's sample resembles the demographic makeup of the total ECLS-K sample for whom child assessment data was available ($n = 19,967$) in spring of Kindergarten. Similar to the present sample, that sample was

comprised of almost equal numbers of girls (n = 9720, 49%) and boys (n = 10,191, 51%). The race/ethnicity of the spring kindergarten participants was the following: 58.1% were White nonhispanic, 15.7% were Black or African American nonhispanic, 13.3 % were Hispanic, 8.5% were Asian (this subgroup included Hawaiian/Pacific Islander), 1.6% were Native American, and 1.1% were Other (this, also, is a slightly different grouping than the “more than one race” category adopted for later data collection) and 1.6% were of “unknown” race.

To obtain a nationally-representative sample of participants in the ECLS-K from kindergarten through 5th grade, a child-level longitudinal weight (C2_6FCO) provided by NCES (2006) was applied to the data. The weight removed children from the sample who either entered the study after kindergarten or were not present through 5th grade for various reasons (e.g., withdrew from the study, switched schools, etc.). By giving participants from oversampled groups a smaller weight and participants from undersampled groups a larger weight, a sample was produced that is representative of the overall population based on 1990 United States census data. The longitudinal weight applied in this study was intended for studies examining up to four data points (i.e., spring of kindergarten, 1st grade, 3rd grade, and 5th grade) with child, school, teacher, and/or classroom variables (NCES, 2006). Applying the longitudinal sample weight to the ECLS-K data set resulted in a sample that included only children who had at least partial data at all three rounds. To minimize the number of additional children excluded, pair-wise deletion of subjects was selected instead of list-wise deletion to account for missing data. As slightly different samples were used for different analyses (due to pair-wise deletion), it is describe the missing subjects. By comparing those children who had

every data point ($n = 5745$) with the total sample ($n = 9160$), however, it may be possible to gain a sense of which demographic groups were more likely to be missing data. In this case, disproportionately more children of white race/ethnicity and disproportionately less children of Black or African American and Hispanic race/ethnicity had complete data.

While applying longitudinal sample weights resulted in a nationally-representative sample, additional adjustments were necessary because participants in the ECLS-K are not a simple random sample of the U.S. population. Instead, the ECLS-K uses a complex survey design (i.e., clustering) to reduce field costs and make data collection feasible. Clustered samples, however, are less variable than simple random samples. If this difference is not accounted for when testing significance, SEs will be underestimated and risk of Type I error increased. In the present study the complex design was adjusted for in two ways. T-tests and regression analyses were conducted using AM software. The AM software program uses the Taylor series method so that SEs account for the complex design. Chi-square analyses were conducted using SPSS software and making approximate adjustments based on the design effect provided in the ECLS-K users' manual.

Procedures and Measures

The ECLS-K is a multi-source, multi-method study that collected information about children's early school experiences. The data analyzed in the current study were collected through teacher questionnaires, direct measures of performance, and student self-report.

Internalizing Symptomatology

Children's internalizing symptoms were assessed with teacher ratings in the spring of Kindergarten, Time 2 (K + 3) and Time 3 (K + 5). Teacher ratings were supplemented with student self-report at Times 2 and 3.

Teachers completed the Social Rating Scale (SRS) teacher form. The SRS is an adaptation of the Social Skills Rating System: Elementary Scale A ("How Often?") (SSRS; Gresham & Elliot, 1990) and is comprised of the following six scales: (a) Approaches to Learning, (b) Self-control, (c) Interpersonal Skills, (d) Peer Relations, (e) Internalizing Problem Behaviors, and (f) Externalizing Problem Behaviors. Respondents use a four-point scale (1=never, 4=very often) to rate how often the child demonstrates the social skill or behavior described. While the scales, with the exception of Peer Relations, are consistent across kindergarten to fifth grade, items vary according to developmental level. As the SRS contains copyright protected material, individual items are not available for review. Instead, the ECLS-K manual (Tourangeau et al, 2006) provides the following description of the SRS internalizing scales:

The **Internalizing Problem Behaviors Scale** consists of four items asking about the apparent presence of anxiety, loneliness, low self-esteem, and sadness.

For each scale, item scores were summed and averaged. Total average scores ranged from one to four, with higher scores indicating the presence of more internalizing symptoms. In the spring of kindergarten, scale reliability (split-half) was .78 (Rock & Pollack, 2002). At Time 2 and Time 3, scale reliability for teacher respondents was .76 and .77 respectively (Pollack, Atkins-Burnett, Najaraian, & Rock, 2005).

Student report of internalizing behavior symptoms was measured by the Self-Description Questionnaire (SDQ) at Times 2 and 3. The Self-Description Questionnaire

(SDQ) consists of six scales comprised of 42 statements assessing children's perceptions of their competence and interest in reading, math, "all school subjects", peer relations, and problematic behavior. Children were asked to rate their behavior in relation to their self-perceptions using a four-point response scale: "not at all true", "a little bit true", "mostly true", or "very true". The SDQ was individually administered during both 3rd and 5th grade data collection and items were read aloud. The **SDQ Sad/Lonely/Anxious** scale was developed specifically for the ECLS-K to assess children's perceptions of internalizing behaviors and is composed of the following items:

- 3. I feel angry when I have trouble learning
- 7. I worry about taking tests
- 14. I often feel lonely
- 20. I feel sad a lot of the time
- 25. I worry about doing well in school
- 29. I worry about finishing my work
- 32. I worry about having someone to play with at school
- 40. I feel ashamed when I make mistakes at school

To obtain the scale score, the eight item scores were summed and averaged. Total average scores range from one to four, with higher scores indicating the presence of more internalizing behavior. Reliability was good for both third grade (.81) and fifth grade (.79) (Pollack et al, 2005). Distribution was positively skewed, reflecting the effect of social desirability. The mean score on the sad/lonely/anxious scale decreased from third to fifth grade (Pollack et al, 2005).

Elevated Internalizing Symptomatology

Children were dichotomously categorized at kindergarten (Time 1), three years later (Time 2) and five years later (Time 3) as having either elevated or typical levels of internalizing symptomatology based on their scores on the internalizing subscale of the SRS. Children scoring at or above two standard deviations above the sample mean were

classified as displaying elevated internalizing symptomatology. Children with scores less than two standard deviations above the sample mean were classified as displaying typical internalizing symptomatology. The mean score on teacher ratings of externalizing symptomatology for the group of children classified as displaying elevated internalizing symptomatology was significantly higher than that of their typical peers. This subsample, therefore, is comprised of some children with more global behavior problems as rated by teachers than just internalizing behavior problems.

Externalizing Symptomatology

Children's externalizing symptoms were assessed with teacher ratings in the spring of Kindergarten, Time 2 (K + 3) and Time 3 (K + 5). Teacher ratings were supplemented with student self-report at Times 2 and 3.

Teachers completed the Social Rating Scale (SRS; described above), teacher form. As the SRS contains copyright protected material, individual items are not available for review. Instead, the ECLS-K manual (Tourangeau et al., 2006) provides the following description of the SRS externalizing scale:

The **Externalizing Behaviors Scale** included acting out behaviors. Items rate the frequency with which a child argues, fights, gets angry, acts impulsively, and disturbs ongoing activities.

To obtain scale scores, item scores were summed and averaged. Total average scores ranged from one to four with higher scores indicating the presence of more externalizing behavior. Scale reliability (split-half) in kindergarten was .90 (Rock & Pollack, 2002). In third and fifth grades, scale reliabilities were .89 and .89, respectively (Pollack et al, 2005).

Teacher ratings were supplemented with student self-report at Times 2 and 3 using the Self-Description Questionnaire (SDQ, described above). The SDQ **Anger/Distractibility Scale** was developed specifically for the ECLS-K to assess children's perceptions of externalizing behaviors and is composed of the following items:

- 5. I often argue with other kids
- 9. It's hard for me to pay attention
- 17. I get distracted easily
- 23. It's hard for me to finish my school work
- 34. I get in trouble for talking and disturbing others
- 37. I get in trouble for fighting with other kids

To obtain the scale score, the six item scores were summed and averaged. Total average scores range from one to four, with higher scores indicating the presence of more problematic behaviors. Scale reliability (alpha coefficient) was .77 for third grade data and .78 for fifth grade (Pollack et al, 2005). Distribution was positively skewed reflecting the effects of social desirability. The mean score for the anger/distractibility scale decreased from third to fifth grade (Pollack et al, 2005).

Self-Concept

Domain specific self-concept (i.e., reading SC, math SC, and social SC) was assessed in the spring of third and fifth grades with children's self-report on selected subscales of the Self-Description Questionnaire (SDQ, described above). Items on the Reading, Math, and Peer scales were adapted from the Self-Description Questionnaire-I (SDQ-I; Marsh, 1990).

The **SDQ Perceived Interest/Competence in Reading** subscale is composed of the following items:

- 4. I get good grades in reading
- 10. I like reading
- 13. Work in reading is easy for me
- 18. I am interested in reading

- 21. I cannot wait to read each day
- 33. I am good at reading
- 35. I like reading long chapter books
- 39. I enjoy doing work in reading

The subscale was created only if there were valid data on at least 5 of the 8 items and was computed as the mean of the items comprising the score.

The **SDQ Perceived Interest/Competence in Math** subscale is composed of the following items:

- 6. Work in math is easy for me
- 12. I cannot wait to do math each day
- 16. I get good grades in math
- 22. I am interested in math
- 26. I can do very difficult problems in math
- 30. I like math
- 36. I enjoy doing work in math
- 41. I am good at math

The subscale was created only if there were valid data on at least 5 of the 8 items and was computed as the mean of the items comprising the score.

The **SDQ Perceived Interest/Competence in Peer Relations** subscale is composed of the following items:

- 1. I have lots of friends
- 11. I make friends easily
- 19. I get along with kids easily
- 24. I am easy to like
- 27. Other kids want me to be their friend
- 31. I have more friends than most other kids

The subscale was created only if there were valid data on at least 4 of the 6 items. The subscale score is computed as the mean of the items comprising the score.

For each scale, item scores were summed and averaged, with higher scores indicating higher functioning or more desirable behaviors. SDQ scale reliabilities (alpha coefficient) are acceptable for both third grade (reading .87, math .90, peer relations .79)

and fifth grade (reading .90, math .92, peer relations .82) data (Pollack et al, 2005). For both grades, distributions on these scales were negatively skewed reflecting the effect of social desirability on responses. The mean score for the math and reading scales decreased from third to fifth grade, while the mean score on the peer relations scale increased slightly.

Academic Competency

Children's level of subject-specific academic skills (i.e., overall math and overall reading) was assessed by direct assessment and teacher ratings in spring of kindergarten, Time 2, and Time 3.

Direct Cognitive Assessments

Direct assessments in reading and mathematics were administered during untimed, one-on-one sessions. Children's responses to items were entered by the examiner into a computer. The first part of each assessment consisted of a routing test to determine the appropriate level of difficulty, allowing for the overall length of the test to be reduced. The direct assessment for reading measured vocabulary, listening and reading comprehension, and basic sight skills. The direct assessment for mathematics measured quantitative and analytic math skills. Item Response Theory (IRT) uses children's performance on test items to provide an estimate of ability (theta) based upon the pattern of right and wrong answers and the relative difficulty of items. This estimate is then used to compute scale and standardized scores (T-scores) for each subject area. The reliability estimates of overall reading ability and overall mathematics ability for Spring of kindergarten, Time 2 and Time 3 were all over .90 (Tourangeau et al., 2006).

Academic Rating Scale (ARS)

The Academic Rating Scale (ARS) was developed to supplement the Direct Cognitive Assessment of subject areas. While the core knowledge assessed is consistent across grades, items changed to reflect developmental expectations. The ARS assesses teachers' perceptions of students' current skill level, knowledge, and behavior. Respondents rated students using a four-point scale ranging from one ("Not Yet Proficient") to four ("Proficient"). A response of Not Applicable indicated that the skill or knowledge had not yet been introduced to the student. The Language and Literacy scale is comprised of nine items assessing each child's proficiency with reading, writing, expressing ideas, and use of strategies to gain information. The Mathematical Thinking scale is comprised of ten items assessing each child's proficiency with number concepts, measurement, operations, geometry, and algebraic thinking. Both of the ARS scales have excellent internal reliability. The reliability of the Language and Literacy scale was .95 for 3rd grade data and .95 for 5th grade data. Similarly, the reliability of the Mathematical Thinking scale was .95 for 3rd grade data and .92 for 5th grade data (Pollack et al, 2005).

Social Competency

Children's social competency was assessed by teacher ratings in the spring of kindergarten, third, and fifth grade. Teachers completed the Social Rating Scale (SRS; described above) teacher form. As the SRS contains copyright-protected material, individual items are not available for review. Instead, the ECLS-K manual (Tourangeau et al., 2006) provides the following descriptions of SRS social skills scales:

The **Interpersonal Skills** scale consists of five items that rate the child's skill in forming and maintaining friendships; getting along with people who are different;

comforting or helping other children; expressing feelings, ideas, and opinions in positive ways; and showing sensitivity to the feelings of others.

To obtain scale scores, item scores were summed and averaged, with higher scores indicating better functioning. Regarding the Interpersonal Skills scale, reliability (split-half) in kindergarten for teacher respondents is .89 (Rock & Pollack, 2002). In third and fifth grades, scale reliabilities for teacher respondents were good: .89 and .88.

Chapter 4: Results

Results addressing the eight research questions are organized in two sections. In the first section, correlations among key variables and results from cross-sectional analyses investigating characteristics of children with elevated internalizing symptomatology are presented. Results of longitudinal analyses investigating whether or not elevated internalizing symptomatology in kindergarten is predictive of later competency and self-concept are presented in the second section.

Cross-sectional Analyses

Question 1. What are the characteristics of children who present with elevated internalizing symptomatology in kindergarten? Do they differ from children with typical levels of internalizing symptomatology with regard to gender, race/ethnicity, SES, early academic skills, and school behavior?

Independent t-tests were employed to identify differences between students with typical internalizing symptomatology and elevated symptomatology on several continuous variables (i.e., teacher ratings of academic and behavior skills). Results are presented in Table 4.

There was a significant difference between the two groups on teacher ratings of both reading and math skills. Specifically, teacher ratings on scales measuring early literacy and math skills were significantly lower for kindergarteners with elevated internalizing symptomatology when compared to their peers with typical levels of internalizing symptomatology. A similar pattern exists with performance measures of reading and math. Kindergarteners with elevated symptomatology performed significantly poorer on the Direct Cognitive Assessments of Reading and of Math than

Table 1

Intercorrelations Among Variables - Time 1

	1	2	3	4	5	6	7	8
1. Gender								
2. T1 Reading T-Score	.09**							
3. T1 Math T-Score	-.02	.77**						
4. T1 Teacher Rating Literacy ARS	.13**	.70**	.64**					
5. T1 Teacher Rating Math ARS	.01**	.59**	.59**	.84**				
6. T1 Teacher Rating Social Skills	.18**	.28**	.28**	.40**	.41**			
7. T1 Teacher Rating Internalizing Behavior	-.03	-.20**	-.18**	-.26**	-.25**	-.37**		
8. T1 Teacher Rating Externalizing Behavior	-.20**	-.19**	-.17**	-.18**	-.17**	-.17**	.27**	

** p<.01.

Table 2
Intercorrelations Among Variables - Time 2

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Gender													
2. T2 Reading T-Score	.07**												
3. T2 Math T-Score	-.12**	.73**											
4. T2 Teacher Rating Literacy ARS	.13**	.65**	.55**										
5. T2 Teacher Rating Math ARS	-.03	.52**	.58**	.81**									
6. T2 Teacher Rating Social Skills	.20**	.26**	.24**	.39**	.30**								
7. T2 Teacher Rating Internalizing Behavior	-.05*	-.26**	-.18**	-.32**	-.29**	-.40**							
8. T2 Teacher Rating Externalizing Behavior	-.21**	-.24**	-.16**	-.28**	-.21**	-.66**	.34**						
9. T2 Reading Self-Concept	.11**	.23**	.06**	.26**	.16**	.12**	-.08*	-.08*					
10. T2 Math Self-Concept	-.13**	-.06**	.14**	.06*	.15**	.06*	-.05*	-.04	.15**				
11. T2 Social Self-Concept	.08**	-.05*	-.05*	.03	.00	.13**	-.13**	-.09**	.33**	.33**			
12. T2 Self-Report Internalizing Behavior	.00	-.38**	-.38**	-.29**	-.24**	-.18**	.17**	.19**	-.08**	-.05*	-.14**		
13. T2 Self-Report Externalizing Behavior	-.16**	-.33**	-.30**	-.29**	-.24**	-.31**	.18**	.37**	-.16**	-.09**	-.20**	.61**	

*p < .05 ** p<.01.

Table 3
Intercorrelations Among Variables - Time 3

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Gender													
2. T3 Reading T-Score	.05*												
3. T3 Math T-Score	-.13**	.73**											
4. T3 Teacher Rating Literacy ARS	.16**	.62**	.56**										
5. T3 Teacher Rating Math ARS	.02	.56**	.64**	.66**									
6. T3 Teacher Rating Social Skills	.24**	.25**	.22**	.42**	.27**								
7. T3 Teacher Rating Internalizing Behavior	-.06**	-.20**	-.23**	-.26**	-.26**	-.38**							
8. T3 Teacher Rating Externalizing Behavior	-.24**	-.23**	-.20**	-.23**	-.23**	-.65**	.30**						
9. T3 Reading Self-Concept	.14**	.32**	.10**	.29**	.15**	.15**	-.07**	-.12**					
10. T3 Math Self-Concept	-.09**	.03	.25**	.13**	.22**	.08**	-.12**	-.04	.12**				
11. T3 Social Self-Concept	.11**	.07**	.06**	.16**	.06	.18**	-.20**	-.12**	.26**	.25**			
12. T3 Self-Report Internalizing Behavior	.03	-.34**	-.36**	-.31**	-.29**	-.13**	.19**	.15**	-.11**	-.12**	-.21**		
13. T3 Self-Report Externalizing Behavior	-.20**	-.34**	-.31**	-.35**	-.27**	-.35**	.18**	.41**	-.21**	-.15**	-.26**	.54**	

*p < .05 ** p<.01.

did their peers with typical levels of symptomatology. Effect sizes for academic measures were moderate, ranging from -.42 to -.61.

Differences were more pronounced on the behavioral measures, with effect sizes ranging from .84 to 1.23. Teacher ratings on scales of self-control, social, and positive classroom behaviors were all significantly lower for children with elevated internalizing symptomatology than for children with typical levels of symptomatology. In addition, teacher ratings of externalizing symptomatology were higher for children with elevated internalizing symptomatology. The mean score on teacher ratings of externalizing symptomatology for the group of children classified as displaying elevated internalizing symptomatology was significantly higher than that of their typical peers. This subsample, therefore, is comprised of some children with more global behavior problems as rated by teachers than just internalizing behavior problems.

Table 4

Means and Standard Deviations in Academic and Behavioral Domains by Level of Internalizing Behavior at Kindergarten

	Typical			Elevated				
Domain/Measure	N	M	SD	N	M	SD	t ^a	d ^b
Academic								
ARS Literacy	8333	3.39	.79	281	2.91	.66	7.14**	-.61
ARS Math	8300	3.58	.85	288	3.12	.78	5.33**	-.54
Direct Cognitive Assess. Reading	8059	50.89	9.80	279	46.72	9.39	3.73***	-.43
Direct Cognitive Assess. Math	8349	50.93	9.88	286	46.78	9.05	4.18***	-.42
Behavioral								
SRS App to Learning	8378	3.13	.67	289	2.37	.68	9.51**	-1.14
SRS Self-Control	8341	3.21	.61	288	2.70	.73	4.90**	-.84
SRS Interpersonal	8305	3.14	.61	269	2.51	.66	6.69**	-1.03
SRS Externalizing	8362	1.64	.60	286	2.40	1.06	-4.47**	1.23

Note. Weighted N's. N.'s vary by measure because of missing data. ARS = Academic Rating Scale. SRS = Social Rating Scale. **p < .01 ***p < .001 ^adf = 90 ^bd = cohen's d.

Chi-square analyses were conducted to determine if there was a relationship between several categorical variables (i.e., gender, race/ethnicity, SES) and kindergarteners' level of internalizing symptomatology. Results are presented in Table 5. With regard to demographic characteristics (gender, race, SES) no differences exist between children with elevated internalizing symptomatology and their peers with typical levels of symptomatology.

Table 5

Crosstabulation of Level of Internalizing Symptomatology at Time 1 and Demographic Characteristics

Demographic Characteristics	Internalizing Behavior			X ²	p
	Total	Typical	Elevated		
Gender					
Male	4356 (50.4%) ^a	4198 (50.3%) ^a	158 (54.7%) ^a	.64	.42
Female	4279 (49.6%) ^a	4148 (49.7%) ^a	131 (45.3%) ^a		
Total	8635	8346 (96.7%) ^b	289 (.03%) ^b		
Race (n = 8654)					
White	5217 (60.3%) ^a	5055 (60.4%) ^a	162 (56%) ^a	.74	.88
Black or African American, Nonhispanic	1219 (14.1%) ^a	1172 (14%) ^a	47 (16.2%) ^a		
Hispanic	1578 (18.2%) ^a	1522(18.2%) ^a	56 (19.4%) ^a		
Asian	212 (2.4%) ^a	209 (2.5%) ^a	3 (1.0%) ^a		
Native Hawaiian/ Other Pacific Islander	43 (0.5%) ^a	41 (<1%) ^a	2 (.69%) ^a		
American Indian/Native Alaskan	151 (1.7%) ^a	144 (1.7%) ^a	7 (2.4%) ^a		
More than one race	234 (2.7%) ^a	222 (2.7%) ^a	12 (4.2%) ^a		
Total	8654	8365 (96.3%) ^b	289 (3.3%) ^b		
SES Quintile					
First	1497 (17.3%) ^a	1428 (17.0%) ^a	69 (24.0%) ^a	4.50	.34
Second	1771 (20.4%) ^a	1707 (20.4%) ^a	64 (22.2%) ^a		
Third	1738 (20.1%) ^a	1675 (20.0%) ^a	63 (21.9%) ^a		
Fourth	1774 (20.5%) ^a	1722 (20.5%) ^a	52 (18.1%) ^a		
Fifth	1774 (21.8%) ^a	1848 (22.1%) ^a	40 (13.9%) ^a		
Total	8668	8380 (96.7%) ^b	288 (3.3%) ^b		

Note. ^aPercentages are for columns. ^bPercentages are for rows.

To summarize, kindergarteners with elevated levels of internalizing symptomatology were rated by teachers as less successful academically and less competent behaviorally than kindergarteners with typical levels of symptomatology. They also performed more poorly on objective assessments of reading and math skills relative to peers with typical levels of symptomatology. They did not differ from their peers with regard to gender, race, or SES.

Question 2: Are the relationships among variables identified in Question 1 (kindergarten) also present at Time 2 (K+3) and Time 3 (K+5)?

Time 2

As with Question 1, independent t-tests were employed to identify differences between children with typical internalizing symptomatology and children with elevated symptomatology with regard to teacher ratings of academic and behavior skills. In addition, the inclusion in the study of the Self-Description Questionnaire (SDQ) allowed comparison of the two groups' self-concept. Eighty-nine percent of children included in the sample were in third grade at Time 2. Results are presented in Table 6.

Results indicate a similar pattern of associations as were found at kindergarten. There was a significant difference between the two groups on teacher ratings of both reading and math skills. Specifically, teacher ratings on scales measuring literacy and math skills were significantly lower for children with elevated internalizing symptomatology when compared to their peers with typical levels of internalizing symptomatology. In addition, children with elevated symptomatology performed significantly poorer on the Direct Cognitive Assessments of Reading and of Math than

did their peers with typical levels of symptomatology. Effect sizes for academic measures were moderate, ranging from -.62 to -.83.

As at kindergarten, larger differences between the two groups were evident on behavioral measures, with effect sizes ranging from -1.10 to 1.30. Teacher ratings on scales of self-control, social, and positive classroom behaviors were all significantly lower for children with elevated internalizing symptomatology than for children with typical levels of symptomatology. In addition, teacher ratings of externalizing symptomatology were higher for children with elevated internalizing symptomatology.

Children with elevated internalizing symptomatology did not differ significantly from their peers on self-report scales of self-perceived reading (SDQ reading) or math competence (SDQ Math). Significant differences were found between the two groups in the social (SDQ Interpersonal) and behavior problem (SDQ Externalizing, SDQ Internalizing) domains. Specifically, children with elevated internalizing symptomatology rated themselves as being less competent and accepted by others than did their peers. In addition, when compared to their peers, these children report significantly more behavior problems, both externalizing and internalizing.

Table 6

Means and Standard Deviations in Academic and Behavioral Domains by Level of Internalizing Behavior at Time 2 (K+3)

Domain/Measure	Typical			Elevated			t-test	
	N	M	SD	N	M	SD	t ^a	d
Academic								
ARS Literacy	6527	3.34	.85	241	2.64	.72	6.06***	-.83
ARS Math	6408	3.13	.73	240	2.65	.70	5.33***	-.66
Direct Cognitive Assess. Reading	6688	51.28	9.60	242	44.41	11.83	3.68***	-.70
Direct Cognitive Assess. Math	6729	51.18	9.59	251	45.19	11.06	3.47**	-.62
Behavioral								
SRS Approach to Learning	6761	3.03	.69	252	2.27	.64	10.20***	-1.10
SRS Self-Control	6734	3.20	.62	250	2.56	.65	7.33***	-1.03
SRS Interpersonal	6670	3.09	.65	242	2.38	.56	15.54***	-1.09
SRS Externalizing	6753	1.72	.61	251	2.50	.83	-7.47***	1.30
Self-Report								
SDQ Reading	6716	3.27	.66	250	3.11	.72	1.76	-.24
SDQ Math	6716	3.11	.77	250	2.98	.81	1.20	-.17
SDQ Interpersonal	6712	3.02	.64	250	2.73	.77	2.50**	-.44
SDQ Externalizing Symptoms	6716	1.96	.69	250	2.23	.86	-2.42*	.38
SDQ Internalizing Symptoms	6716	2.18	.71	250	2.47	.80	-2.77**	.41

Note. Weighted N's. N.'s vary by measure because of missing data. ARS = Academic Rating Scale. SRS = Social Rating Scale. SDQ = Self-Description Questionnaire.

*p<.05 **<.01 ***p<.001 ^adf = 9 ^bd = cohen's d.

Next, chi-square analyses were conducted to determine if there was a relationship between several categorical variables (i.e., gender, race/ethnicity, SES) and children's level of internalizing symptomatology. Results are presented in Table 7. With regard to gender, no differences exist between children with elevated internalizing symptomatology and their peers with typical levels of symptomatology. A chi-square test of significance was not conducted for race/ethnicity due to cells with zero subjects. A significant relationship was found for SES. In the second quintile, more children than expected demonstrated elevated levels of internalizing symptomatology. In contrast, in the fifth quintile, fewer children than expected had elevated internalizing symptomatology.

Table 7

Crosstabulation of Level of Internalizing Symptomatology at Time 2 and Demographic Characteristics

Demographic Characteristics	Internalizing Behavior			X ²	p
	Total	Typical	Elevated		
Gender					
Male	3401 (48.4%) ^a	3257 (48.2%) ^a	144 (57.4%) ^a	2.0	.16
Female	3612 (51.6%) ^a	3505 (51.8%) ^a	107 (42.6%) ^a		
Total	7013	6762 (96.4) ^b	251 (3.6) ^b		
Race ^c					
White	4447 (63.5%) ^a	4328 (64.1%) ^a	119 (47.6%) ^a	14.40	.006
Black or African American, nonhispanic	901 (12.9%) ^a	845 (12.5%) ^a	56 (22.4%) ^a		
Hispanic	1176 (16.8%) ^a	1123 (16.6%) ^a	53 (21.2%) ^a		
Asian	159 (2.3%) ^a	159 (2.4%) ^a	0		
Native Hawaiian/Other Pacific Islander	42 (0.6%) ^a	42 (.6%) ^a	0		
American Indian/ Native Alaskan	123 (1.8%) ^a	115 (1.7%) ^a	8 (3.2%) ^a		
More than one race	152 (2.2%) ^a	138 (2.0%) ^a	14 (5.6%) ^a		
Total	7000	6750 (96.4%) ^b	250 (3.6%) ^b		
SES Quintile					
First	925 (14.8%) ^a	876 (14.5%) ^a (-.3)	49 (22.4%) ^a (1.4)	14.40	.006
Second	1166 (18.6%) ^a	1101 (18.2%) ^a (-.4)	65 (29.7%) ^a (1.9)		
Third	1252 (20.0%) ^a	1215 (19.4%) ^a (.1)	37 (16.9%) ^a (-.5)		
Fourth	1391 (22.3%) ^a	1337 (21.4%) ^a (-.1)	54 (24.7%) ^a (.3)		
Fifth	1523 (24.3%) ^a	1509 (24.1%) ^a (.5)	14 (6.4%) ^a (-2.5)		
Total	6257	6038 (96.5%) ^b	219 (3.5%) ^b		

Note. When chi-square statistic is significant, adjusted standardized residuals appear in parentheses below group frequencies. ^aPercentages are for columns. ^bPercentages are for rows. ^cTest of significance was not conducted due to cells with n < 0.

In summary, children with elevated levels of internalizing symptomatology were rated by teachers as less successful academically and less competent behaviorally than children with typical levels of symptomatology. They also performed poorer on objective assessments of reading and math skills relative to peers with typical levels of symptomatology. In addition, children with elevated levels of internalizing symptomatology perceived themselves to be less competent socially and reported more externalizing and internalizing symptoms. They did not differ from their peers with regard to gender. More children than expected with elevated symptomatology fell in the second SES quartile and fewer in the uppermost SES category.

Time 3.

The same analyses were then run using Time 3 (K + 5 years) data. The majority of children, 86 percent, were in fifth grade at this time. Independent t-tests were conducted to identify differences between children with typical internalizing symptomatology and children with elevated symptomatology with regard to teacher ratings of skills and self-concept. Results are presented in Table 8.

Results were less consistent across domains at Time 3 than they had been at kindergarten and Time 2. Effect sizes for significant differences on academic measures ranged from $-.80$ to $-.25$. There continued to be a significant difference between the two groups on teacher ratings of both reading and math skills, with ratings significantly lower for children with elevated internalizing symptomatology. Differences on performance measures, however, were either non-significant (reading) or much weaker than those found at earlier grades (math, $d = -.38$).

While the pattern of differences on behavioral measures were similar to that found at Time 1 and Time 2, the strength of the differences were more varied, with effect sizes ranging from -1.03 to .64. Teacher ratings on scales of self-control, social, and positive classroom behaviors were all significantly lower for children with elevated internalizing symptomatology than for children with typical levels of symptomatology. In addition, teacher ratings of externalizing symptomatology were higher for children with elevated internalizing symptomatology. The magnitude of this difference at Time 3 ($d = .64$), however, was approximately half of that found at Time 1 ($d = 1.23$) and Time 2 ($d = 1.30$).

Children with elevated internalizing symptomatology did not differ significantly from their peers on self-report scales of reading (SDQ reading). The difference between groups on math self-concept was significant, but weak. Significant differences were found between the two groups in the social (SDQ Interpersonal) and behavior problem (SDQ Externalizing, SDQ Internalizing) domains. Specifically, children with elevated internalizing symptomatology rated themselves as being less competent and accepted by others than did their peers. In addition, when compared to their peers, these children reported significantly more behavior problems, both externalizing and internalizing. Differences, however, were weak to moderate, with effect sizes ranging from .29 to -.57.

Table 8

Means and Standard Deviations in Academic and Behavioral Domains by Level of Internalizing Behavior at Time 3

	Typical			Elevated				
Domain/Measure	N	M	SD	N	M	SD	t ^a	d ^b
Academic								
ARS Literacy	7845	3.46	.82	316	2.81	.65	6.62***	-.80
ARS Math	3860	3.42	.70	156	3.01	.68	3.23**	-.59
Direct Cognitive Assess. Reading	7870	50.98	9.74	312	48.49	10.86	1.80	-.25
Direct Cognitive Assess. Math	7879	50.90	9.77	315	47.14	9.49	3.04**	-.38
Behavioral								
SRS Approach to Learning	7920	3.05	.68	316	2.36	.58	11.65***	-1.03
SRS Self-Control	7830	3.23	.60	314	2.77	.66	6.31***	-.77
SRS Interpersonal	7744	3.08	.64	310	2.43	.62	9.58***	-1.03
SRS Externalizing	7883	1.68	.60	316	2.07	.74	-5.28***	.64
Self-Report								
SDQ Reading	7878	3.02	.74	315	2.89	.75	1.31	-.18
SDQ Math	7878	2.93	.78	315	2.74	.74	2.78*	-.25
SDQ Interpersonal	7878	2.99	.63	315	2.63	.69	5.38***	-.57
SDQ Externalizing Symptoms	7878	1.85	.67	315	2.05	.73	-2.51**	.29
SDQ Internalizing Symptoms	7878	2.03	.62	315	2.32	.09	-3.42**	.47

Note. Weighted N's. N.'s vary by measure because of missing data. ARS = Academic Rating Scale. SRS = Social Rating Scale. SDQ = Self-Description Questionnaire.

*p<.05 **<.01 ***p < .001 ^adf = 90 ^bd = cohen's d.

Finally, chi-square analyses were conducted to determine if there was a relationship between several categorical variables (i.e., gender, race/ethnicity, SES) and children's level of internalizing symptomatology. Results are presented in Table 9. With regard to gender, no differences exist between fifth graders with elevated internalizing symptomatology and their peers with typical levels of symptomatology. A chi-square test of significance was not conducted for race/ethnicity due to an unacceptable percentage of cells with less than five subjects. A significant relationship was found for SES. In the first quintile, more children than expected due to chance demonstrated elevated levels of internalizing symptomatology. In contrast, in the fifth quintile, fewer children than expected had elevated internalizing symptomatology. This pattern is similar to Time 2 results and suggests that SES, at its extremes, is associated with risk or protective factors for internalizing symptomatology.

Table 9

Crosstabulation of Level of Internalizing Symptomatology at Time 3 and Demographic Characteristics

Demographic Characteristics	Internalizing Behavior			X ²	p
	Total	Typical	Elevated		
Gender					
Male	4062 (49.2%) ^a	3884 (49.0%) ^a	178 (56.3%) ^a	1.66	.20
Female	4185 (49.8%) ^a	4047 (51.0%) ^a	138 (43.7%) ^a		
Total	8247	7931 (96.2%) ^b	316 (3.8%) ^b		
Race ^c					
White	4908 (60.0%) ^a	4702 (59.3%) ^a	206 (77.2%) ^a	12.29	.02
Black or African Amer., nonhispanic	1175 (14.3%) ^a	1172 (14.7%) ^a	3 (1.1%) ^a		
Hispanic	1522 (18.6%) ^a	1472 (18.5%) ^a	50 (18.7%) ^a		
Asian	204 (2.5%) ^a	203 (2.5%) ^a	1 (.4%) ^a		
Native Hawaiian/ Pacific Islander	41 (0.5%) ^a	40 (.5%) ^a	1 (.4%) ^a		
Amer. Indian/ Native Alaskan	138 (1.7%) ^a	133 (1.7%) ^a	5 (1.9%) ^a		
More than one race	195 (2.4%) ^a	194 (2.4%) ^a	1 (.4%) ^a		
Total	8183	7916 (96.7%) ^b	267 (3.3%) ^b		
SES Quintile					
First	1299 (17.1%) ^a	1211 (15.2%) ^a (-.6)	88 (31.0%) ^a (2.9)	12.29	.02
Second	1410 (18.5%) ^a	1351 (17.0%) ^a (-.1)	59 (20.8%) ^a (.3)		
Third	1557 (20.4%) ^a	1503 (18.9%) ^a (.1)	54 (19.0%) ^a (-.3)		
Fourth	1663 (21.8%) ^a	1611 (20.3%) ^a (.1)	52 (18.3%) ^a (-.6)		
Fifth	1689 (22.2%) ^a	1658 (20.1%) ^a (.4)	31 (10.9%) ^a (-1.9)		
Total	7618	7334 (96.3%) ^b	284 (3.7%) ^b		

Note. When chi-square statistic is significant, adjusted standardized residuals appear in parentheses below group frequencies. ^aPercentages are for columns. ^bPercentages are for rows. ^cTest of significance was not conducted due to an unacceptable percentage of cells with $n < 5$.

Longitudinal Analyses

Question 3. Is high internalizing symptomatology in kindergarten indicative of a stable characteristic that persists over time? Do children with this characteristic in kindergarten continue to evidence this characteristic three years and five years later?

A chi-square analysis was employed to determine whether the number of children that met the cutoff for elevated internalizing symptomatology at both Time 1 and Time 2 was significantly different from the number expected due to chance. Results of this test were not significant (See Table 10.), indicating that many students with elevated symptomatology in kindergarten were no longer rated as exhibiting this characteristic three years later.

A second chi-square analysis, comparing Time 1 and Time 3, returned the same results. This test were also not significant (See Table 11.), indicating that many students with elevated symptomatology in kindergarten no longer exhibited this characteristic five years later.

Table 10

Crosstabulation of Level of Internalizing Symptomatology at Time 1 and Time 2

		Time 1 Internalizing Behavior			X ²	p
		Total	Typical	Elevated		
Time 2 Internalizing Behavior						
Typical		6433 (96.5%) ^a	6250 (96.7%) ^a	183 (91.5%) ^a	2.53	.12
Elevated		230 (3.5%) ^a	213 (3.3%) ^a	17 (8.5%) ^a		
Total		6663	6463 (97.0%) ^b	200 (3.0%) ^b		

Note. ^aPercentages are for columns. ^bPercentages are for rows.

Table 11

Crosstabulation of Level of Internalizing Symptomatology at Time 1 and Time 3

Time 1 Internalizing Behavior					
	Total	Typical	Elevated	X ²	p
Time 3 Internalizing Behavior					
Typical	7541 (96.8%) ^a	7294 (96.9%) ^a	247 (92.8%) ^a	3.05	.08
Elevated	253 (3.2%) ^a	234 (3.1%) ^a	19 (7.1%) ^a		
Total	7794	7528 (96.6%) ^b	266 (3.4%) ^b		

Note. ^aPercentages are for columns. ^bPercentages are for rows.

While neither test was significant, results do trend consistent with some stability over time. At both times, the observed count for the elevated/elevated condition is more than double that expected (see Tables 10 and 11).

Question 4. Is elevated symptomatology stable over a two-year period in middle childhood? Do children with elevated internalizing symptomatology in third grade continue to evidence this characteristic two years later?

Similar to the analysis conducted for Question 3, a chi-square analysis was again employed to determine whether the number of children that met the cutoff for elevated internalizing symptomatology at both Time 2 and Time 3 was significantly different from the number expected due to chance. Results indicate that a significant number of children who exhibit elevated internalizing symptomatology at Time 2 also exhibit elevated internalizing symptomatology at Time 3. More than three times as many children were observed in the elevated/elevated condition than expected due to chance (see Table 12). However, the majority of children exhibiting elevated internalizing symptomatology at Time 2 no longer did so two years later.

Table 12

Crosstabulation of Level of Internalizing Symptomatology at Time 2 and Time 3

		Time 2 Internalizing Behavior			X ²	p
		Total	Typical	Elevated		
Time 3 Internalizing Behavior						
Typical	6313 (96.1%) ^a	6119 (96.4%) ^a (.1)	194 (85.5%) ^a (-.8)	10.18	.001	
Elevated	259 (3.9%) ^a	226 (3.6%) ^a (-.7)	33 (14.5%) ^a (3.9)			
Total	6572	6345 (96.5%) ^b	227 (3.5%) ^b			

Note. Adjusted standardized residuals appear in parentheses below group frequencies. ^aPercentages are for columns. ^bPercentages are for rows

Question 5. What are the relationships among internalizing symptomatology in kindergarten and later academic and social competence?

5a. Do children with elevated internalizing symptomatology in kindergarten differ from their peers three years later on measures of academic and social competence, even when controlling for gender and concurrent levels of internalizing symptoms?

To address Question 5a, hierarchical multiple regression procedures were conducted with each of the three T2 competency domain measures (ARS Literacy, ARS Math, and SRS Interpersonal) as the dependent variables. Step 1 of the regression equations included gender and T2 internalizing symptomatology as independent variables. Step 2 included, as an additional independent variable, T1 internalizing symptoms as the predictor variable of interest. The significance of the difference in R^2 between Step 1 and Step 2 indicated whether T1 internalizing symptoms uniquely contributed to T2 variables. Results are presented in Tables A.1-A.3 in Appendix A.

Regression analyses indicate that elevated internalizing symptomatology in kindergarten had no significant effects on reading, math, or social competency three years later when controlling for gender and concurrent internalizing symptomatology. Changes in the R^2 values from Step 1 to Step 2 were less than .01 and were non-significant in each case. Gender and concurrent internalizing symptoms together accounted for a moderate proportion of the variance in reading ($R^2 = .11$, $F(2,1580) = 99.90$, $p < .001$), math ($R^2 = .09$, $F(2,1550) = 72.94$, $p < .001$), and social competency scores ($R^2 = .19$, $F(2,1608) = 189.97$, $p < .001$). To address the concern that the relationship between concurrent internalizing symptomatology and domain specific competency was masking a relationship between kindergarten internalizing status and Time 2 competency, supplemental regression analyses with gender and kindergarten internalizing status

entered at Step 1 and gender, kindergarten internalizing status, and concurrent internalizing symptomatology entered at Step 2 were conducted. None of these three analyses were significant.

5b. Do children with elevated internalizing symptomatology in kindergarten differ from their peers five years later on measures of academic and social competence, even when controlling for gender and concurrent levels of internalizing symptoms?

To address Question 5b, the same hierarchical multiple regression procedures were conducted as with Question 4a with each of the three T3 competency domain measures (ARS Literacy, ARS Math, and SRS Interpersonal) as the dependent variables. Results are presented in Tables A.4-A.6 in Appendix A.

As with Time 2, regression analyses indicated that elevated internalizing symptomatology in kindergarten had no significant relationship with reading, math, or social competency five years later when controlling for gender and concurrent internalizing symptomatology. Gender and concurrent internalizing symptoms together accounted for a moderate proportion of the variance of reading ($R^2 = .13$, $F(2,1890) = 136.25$, $p < .001$), math ($R^2 = .07$, $F(2,942) = 32.48$, $p < .001$), and social competency scores ($R^2 = .19$, $F(2,1865) = 218.64$, $p < .001$). To address the concern that the relationship between concurrent internalizing symptomatology and domain specific competency was masking a relationship between kindergarten internalizing status and Time 3 competency, supplemental regression analyses with gender and kindergarten internalizing symptomatology entered at Step 1 and gender, kindergarten symptomatology, and concurrent internalizing symptomatology entered at Step 2 were conducted. While kindergarten internalizing symptomatology did explain a very small

proportion of the variance in social competency at Time 3, this relationship was no longer significant when concurrent internalizing symptomatology was accounted for. Neither of the analyses of academic competence was significant.

Question 6. What are the relationships among internalizing symptomatology in kindergarten and later academic and social self-concept?

6a. Do children with elevated internalizing symptomatology in kindergarten differ from their peers three years later on measures of academic and social self-concept, even when controlling for gender and concurrent levels of internalizing symptoms?

To address Question 6a, hierarchical multiple regression procedures were conducted with each of the three T2 self-concept domain measures (SDQ Reading, SDQ Math, and SDQ Social) as the dependent variables. Step 1 of the regression equations included gender and T2 internalizing symptomatology as independent variables. Step 2 included, as an additional independent variable, T1 internalizing symptoms as the predictor variable of interest. The significance of the difference in R^2 between Step 1 and Step 2 indicated whether T1 internalizing symptoms uniquely contributed to T2 variables. Results are presented in Tables A.7-A.9 in Appendix A.

Regression analyses indicated that elevated internalizing symptomatology in kindergarten had no significant effects on reading, math, or social self-concept three years later when controlling for gender and concurrent internalizing symptomatology. Gender and concurrent internalizing symptoms together accounted for a negligible proportion of the variance in reading ($R^2 = .02$, $F(2,1626) = 14.21$, $p < .001$.), math ($R^2 = .03$, $F(2,1626) = 23.56$, $p < .001$), and social competency scores ($R^2 = .02$, $F(2,1626) = 14.19$, $p < .001$). To address the concern that the relationship between concurrent

internalizing symptomatology and domain specific self-concept was masking a relationship between kindergarten internalizing status and Time 2 competency, supplemental regression analyses with gender and kindergarten internalizing status entered at Step 1 and gender, kindergarten internalizing status, and concurrent internalizing symptomatology entered at Step 2 were conducted. None of these three analyses were significant.

6b. Do children with elevated internalizing symptomatology in kindergarten differ from their peers five years later on measures of academic and social self-concept, even when controlling for gender and concurrent levels of internalizing symptoms?

To address Question 6b, the same hierarchical multiple regression procedures were conducted as with Question 5a for each of the three T3 domain specific self-concept measures (SDQ Reading, SDQ Math, and SDQ Peer) as the dependent variables. Results are presented in Tables A.10-A.12 in Appendix A.

As with Time 2, regression analyses indicated that elevated internalizing symptomatology in kindergarten had no significant relationship with reading, math, or social self-concept five years later when controlling for gender and concurrent internalizing symptomatology. Again, gender and concurrent internalizing symptoms together accounted for a negligible proportion of the variance in reading ($R^2 = .03$, $F(2,1902) = 25.85$, $p < .001$), math ($R^2 = .03$, $F(2,1902) = 26.02$, $p < .001$), and social competency scores ($R^2 = .04$, $F(2,1902) = 40.92$, $p < .001$). To address the concern that the relationship between concurrent internalizing symptomatology and domain specific self-concept was masking a relationship between kindergarten internalizing status and Time 2 competency, supplemental regression analyses with gender and kindergarten

internalizing status entered at Step 1 and gender, kindergarten internalizing status, and concurrent internalizing symptomatology entered at Step 2 were conducted. None of the three analyses were significant.

Question 7. To what extent are the relationships between internalizing symptoms in kindergarten and later domain specific competency (reading, math, social) mediated by domain specific self-concept?

As addressed by Question 5, no significant relationships were found between elevated internalizing symptomatology in kindergarten and domain specific competency at Time 2 or at Time 3. Planned analyses included hierarchical multiple regression procedures with each of the three Time 2 and three Time 3 competency measures as the dependent variable. Steps 1 of the regression equations were to include gender, concurrent internalizing symptomatology, and kindergarten internalizing status (elevated vs. typical) as independent variables. Steps 2 of the regression equations were to include, as an additional independent variable, concurrent domain specific self-concept. A test of the significance of the differences between the beta weights for kindergarten internalizing status for between Step 1 and Step 2 would have served to test the hypothesis that domain specific self-concept mediates the relationship between kindergarten internalizing status and later competency. As no relationship was found between elevated internalizing symptomatology and later competency, no mediation could exist and, therefore, the planned analyses were not conducted.

Question 8. To what degree does domain specific competency (reading, math, social) in kindergarten serve to moderate the relationship between internalizing symptoms in kindergarten and later domain specific self-concept?

As determined by Question 6, no significant relationships were found between elevated internalizing symptomatology in kindergarten and domain specific self-concept at Time 2 or Time 3. While this is so for the group as a whole, Question 8 asks whether relationships exist for students at differing levels of kindergarten competency. Accordingly, it is possible that significant interaction effect (i.e., moderation) exists. To address Question 8, analyses included multiple regression procedures with each of the three Time 2 and three Time 3 competency measures as the dependent variable. The regression equations included the direct effects of kindergarten internalizing status (elevated vs. typical) and kindergarten domain specific competency, and the interaction effect of the two (the product of kindergarten internalizing status and kindergarten competency). Gender was also included to control for this variable. A test of significance of the beta weight of the interaction term in the regression equation served to test the hypothesis that kindergarten domain specific competency moderates the relationship between kindergarten internalizing status and later self-concept. Results are presented in Tables A.13-A.18 in Appendix A.

Regression analyses were consistent with results of Question 6. That is, no significant relationship was found between internalizing status in kindergarten and later reading, math, or social self-concept when controlling for gender. Domain specific competence in kindergarten did predict later self-concept in the reading (T2 and T3), math (T3 only), and social (T2 and T3) domains. The interaction term (internalizing status x kindergarten competency) did not significantly contribute to the proportion of variance for any domain.

Supplemental Analyses

Supplemental analyses were conducted to further explore relationships among study variables. Cross-sectional analyses are discussed first, followed by results of longitudinal analyses.

Cross-sectional Analyses

The first set of analyses examines whether or not any interaction exists between gender and race that accounts for differences in level of internalizing symptomatology. Because of the relatively small numbers of sample children in the Asian, Native Hawaiian/Other Pacific Islander, American Indian/Native Alaskan, and more than one race categories, crosstabulation resulted in several empty cells. Therefore, these groups were excluded from these and all subsequent analyses. Three 3 (Race/Ethnicity) x 2 (Gender) x 2 (Internalizing Status) chi-square analyses, one each for T1, T2, and T3, were conducted to address this question. Results are presented in tables A.19 – A. 21 in the Appendix.

Results of these supplemental analyses are consistent with the results discussed under Questions 1 and 2 that suggest demographic variables (e.g., gender, race/ethnicity) are not related to elevated internalizing symptomatology in kindergarten or middle childhood. Chi-square analyses yielded no significant interactions. This was true for two-way relationships (gender x status) within race/ethnicities and when all three factors were accounted for at the same time.

Effect of Race/Ethnicity on Temporal Relationships

The analyses conducted to address Questions 5 and 6 found that no relationship existed between kindergarten internalizing symptomatology and later self-concept or

competency for this racially/ethnically diverse sample of children as a whole. The second set of supplemental analyses examined whether or not a relationship existed between kindergarten internalizing symptomatology and later self-concept or competency *for children of differing race/ethnicities*. To address this question, analyses tested 12 multiple regression equations with each of the three competency measures and each of the three self-concept measures at Times 2 and 3 as the dependent variable. In all, 36 regression equations were tested (12 each for the three race/ethnicities under study). The regression equations included the direct effects of kindergarten internalizing status (elevated vs. typical), race/ethnicity (White vs. non-White, Black vs. non-Black, or Hispanic vs. non-Hispanic) and the interaction effect of the two (the product of kindergarten internalizing status and race/ethnicity). Gender and concurrent internalizing symptoms were also included to control for these variables. A test of significance of the beta weight of the interaction term in the regression equation served to test the hypothesis that the relationship between kindergarten internalizing status and later competency and self-concept is different for differing race/ethnicities.

Results of the regression analyses were consistent with results of Questions 5 and 6. That is, for 35 out of 36 regression equations, a significant relationship was not found between internalizing status in kindergarten and later competency or self-concept when controlling for gender and concurrent internalizing symptoms. The one exception being that for white children only, the interaction term (internalizing status x race/ethnicity) significantly contributed to the proportion of variance in 3rd grade reading self-concept ($\beta = .18, p < .05$).

Effect of Gender on Temporal Relationships

The third set of supplemental analyses examined whether or not a relationship existed between kindergarten internalizing symptomatology and later self-concept or competency for children of differing genders. To address this question, analyses tested 12 multiple regression equations with each of the three competency measures and each of the three self-concept measures at Times 2 and 3 as the dependent variable. The regression equations included the direct effects of kindergarten internalizing status (elevated vs. typical), gender, and the interaction effect of the two (the product of kindergarten internalizing status and gender). Concurrent internalizing symptoms was also included to control for this variable. A test of significance of the beta weight of the interaction term in the regression equation served to test the hypothesis that the relationship between kindergarten internalizing status and later competency and self-concept is different for the different genders.

Results of the regression analyses were again consistent with results of Questions 5 and 6. That is, for 11 out of 12 regression equations, a significant relationship was not found between internalizing status in kindergarten and later competency or self-concept when controlling for concurrent internalizing symptoms. The one exception being that the interaction term (internalizing status x gender) significantly contributed to the proportion of variance in 5th grade math self-concept ($\beta = -.19, p < .01$).

Effect of Race/Ethnicity and Gender on Temporal Relationships

The final set of supplemental analyses examined whether the relationship between kindergarten internalizing symptomatology and later competency and self-concept is affected by the interaction of race/ethnicity and gender. To address this question, analyses tested 12 multiple regression equations with each of the three competency measures and

each of the three self-concept measures at Times 2 and 3 as the dependent variable. In all, 36 regression equations were tested (12 each for the three race/ethnicities under study). The regression equations included the direct effects of gender, kindergarten internalizing status (elevated vs. typical), and race/ethnicity (White vs. non-White, Black vs. non-Black, or Hispanic vs. non-Hispanic). They also included the interaction terms for gender x status, gender x race/ethnicity, and race/ethnicity x status. The final interaction term, gender x race/ethnicity x status, addressed the question. Concurrent level of internalizing symptoms was also included to control for this variable. A test of significance of the beta weight of the 3-way interaction term in the regression equation served to test the hypothesis that the relationship between kindergarten internalizing status and later competency and self-concept is affected by the interaction of gender and race/ethnicity.

Results of the regression analyses were again consistent with results of Questions 5 and 6. That is, no significant relationship was found between internalizing status in kindergarten and later competency or self-concept when controlling for concurrent internalizing symptoms. The interaction term (internalizing status x gender x race/ethnicity) did not significantly contribute to the proportion of variance for any domain.

Chapter 5: Discussion

The primary goals of the present study were to: (a) describe characteristics of children who present with elevated internalizing symptomatology using a large, nationally representative sample, (b) investigate stability of elevated internalizing status across early and middle childhood, and (c) explore possible relationships between elevated symptomatology in kindergarten and later competence and self-concept. This chapter discusses results of the present study aligned with these three goals, implications for practice and future research, and study limitations.

Selected Characteristics of Children with Elevated Internalizing Symptomatology

Demographic Characteristics

Gender differences in internalizing symptomatology and depression are not found before adolescence (Sterba, Prinstein, & Cox, 2007). In the current study, gender differences between children with elevated and typical levels of internalizing symptomatology were not found during any of the rounds of data collection. This finding is consistent with prior research that has found that boys and girls demonstrate equal levels of internalizing symptoms (Feng & Cartledge, 2006; Rudolph, 2002) in early/middle childhood, with differences not emerging until adolescence (Zahn-Waxler, Klimes-Dougan, & Slattery, 2000). Other studies, however, have documented early and stable gender differences (Merrell & Dobmeyer, 1996; Sommers, 2000). Sterba et al. (2007) posit that these seemingly contradictory findings may be the result of variation in the developmental pathways of symptomatology for boys and girls, with gender differences occurring in the timing and trajectory of childhood internalizing disorders.

An association between race/ethnicity and elevated internalizing symptomatology was not found in the present study. This finding is inconsistent with previous studies that have documented disproportionately high reported rates of internalizing behavior problems for African American youth (for review, see Gabalda, Thompson, Kaslow, 2010; Randolph, Koblinsky, Beemer, Roberts, & Letiecq, 2000). Perhaps the relationship found in these studies reflects the influence of another variable (e.g., SES) related to race/ethnicity. In a review of literature on the topic, Samaan (2000) found that after controlling for SES, African American and Hispanic children were less likely to display internalizing symptomatology than Caucasian children.

Elevated internalizing symptomatology was, indeed, found to be associated with SES in the current study and a pattern of differences was found among levels of Social Economic Status (SES). While no difference in SES was found at kindergarten, differences were present at Times 2 and 3. At these times, the numbers of children in the highest SES quintile with elevated symptomatology were significantly less than expected. In addition, there were significantly more children with elevated symptomatology than expected in the lower quintiles (the second at T2, the first at T3). This pattern of results is consistent with prior research findings that SES is associated with risk or protective factors for internalizing symptomatology. For example, poverty is often associated with increased internalizing behavior symptoms in childhood (e.g., Keiley et al., 2000; McLeod & Shanahan, 1996).

Internalizing Symptomatology and Competency

Elevated internalizing symptomatology was associated with weaker academic skills. Across kindergarten and middle childhood, children with elevated internalizing

symptomatology exhibited significantly weaker academic skills when compared with peers with typical levels of symptomatology. This was so when competency was assessed by both teacher ratings and performance on assessments. The association between internalizing symptomatology and academic achievement has been documented elsewhere in the literature (Elder & Conger, 2000; Chen, Rubin, & Li, 1995; Maughan, Rowe, Loeber, & Stouthamer-Loeber, 2003).

Elevated internalizing symptomatology was also associated with less social and behavioral competence at all three points in time. Children with elevated internalizing symptomatology were rated by teachers as exhibiting less self-control, less positive learning behaviors, and less social skills than their peers. Elevated internalizing symptomatology was also associated with increased externalizing behavior problems. As these findings are correlational, it is impossible to determine the nature of the relationships (i.e., causative, reciprocal, etc.) among these variables. This pattern of dysfunction across diverse domains may, in fact, reflect an underlying deficit in the ability to regulate behavior and emotion, as has been described in the temperament and developmental psychopathology literature (for example, see Rothbart, Ellis, & Posner, 2004).

Internalizing Symptomatology and Self-Concept

Elevated internalizing symptomatology was associated with social, but not academic self-concept. Children's domain specific self-concept was assessed by administration of the Self Description Questionnaire (SDQ) at Times 2 and 3, when most children were in third and fifth grades, respectively. With the exception of math at Time 3, children with elevated symptomatology did not differ significantly from their peers

with regard to academic self-concept. In contrast to teacher ratings and performance on a direct measure, these children's self-ratings were no less negative than those of their peers. In middle childhood children's self-perceptions tend to become more realistic (i.e., consistent with perceptions of others, grounded in performance) and it was expected that children with elevated internalizing symptoms would be particularly cognizant of any areas of weakness. While these students' academic skills are weaker than those of their peers, perhaps the relative weaknesses found in this study were not salient to individual students. In fact, their positive academic self-concept may indicate positive bias in this domain.

Regarding social self-concept, children with elevated internalizing symptomatology rated themselves as being less competent and accepted by others than did their peers. Given that teachers also rate these children as having weaker interpersonal skills, this finding suggests an accurate self-perception. The correlation between social self-concept and internalizing symptomatology in middle childhood likely reflects a reciprocal relationship between these variables. Perhaps perceived difficulty in the social domain is particularly salient for children in middle childhood, leading to increased feelings of sadness and other internalizing behaviors. In addition, the presence of internalizing behaviors (withdrawal, anxiety, etc.) likely interferes with positive social interactions for these children.

Overall, these findings are consistent with previous research indicating that elevated internalizing symptomatology in childhood is associated with negative self-concept (Cole et al, 1998; Jacobs et al., 2002; Wigfield et al., 1997). The finding that, as a group, children with elevated internalizing symptomatology did not demonstrate negative

self-evaluations relative to their typical peers across all domains was, however, unexpected. The cross-sectional analyses included in the current study do not advance our understanding of the causal nature of this relationship.

Stability of Elevated Internalizing Symptomatology in Early and Middle Childhood

While stability within, and even across, developmental periods has been well established for externalizing symptomatology, the literature on continuity of early internalizing symptomatology over time is challenging to interpret. For example, three recent studies resulted in three contradictory findings. Internalizing symptoms were found to either increase, decrease, or remain stable from early to middle childhood (Colder, Mott, & Berman, 2002; Garelle & Ladd, 2003; Keiley, Lofthouse, Bates, Dodge, & Petit, 2003, as reviewed in Sterba, Prinstein, & Cox, 2007). Sterba et al. posit that these contradictory findings are due to heterogeneous trajectories for different subgroups of children and recommend using a person-oriented analytic approach to address this. In employing such a method, Sterba et al. (2007) indeed found three different trajectories in a non-referred sample. The majority of children evidenced a low-stable trajectory, with smaller percentages of children evidencing unstable or high-stable trajectories. The current study's finding that the large majority of students in this sample evidence typical levels of internalizing symptomatology and continue to do so over time, does seem to be consistent with results of the Sterba et al. (2007) study.

Kindergarten to Time 2 (K+3 years) and Time 3 (K+5)

Stability of *elevated* internalizing symptomatology across time was not found in the current study. Most children (92%) who fell above the cutoff (2 SDs above the mean) in kindergarten no longer did so three years later and 93% no longer did so five years

later. While it seems surprising that so many of the children above the cutoff at kindergarten were no longer classified as such three and five years later, this finding is, in part, an artifact of the study design. The “elevated internalizing symptomatology” subgroup was comprised of individuals measured at such extreme levels of this variable, and the correlation between the variables relatively small, the effect of regression towards the mean on subsequent measurement was likely large.

Middle Childhood (Time 2 to Time 3)

Some stability of *elevated* internalizing symptomatology was found over a shorter period of time (T2 to T3). Significantly more children with elevated symptomatology than expected due to chance continued to exhibit this characteristic two years later. While this finding is statistically significant, the majority of children (85%) who fell above the cutoff at Time 2 no longer did so two years later.

To summarize, teacher-rated elevated internalizing symptomatology was very unstable from early to middle childhood, and only slightly more stable within the middle childhood years. There are several possible explanations for these findings. First, as discussed in the previous section, these findings are likely due, in part, to regression towards the mean. This phenomenon has serious implications for clinical decision making, particularly when extreme scores at one point in time are used to try to identify individuals at-risk for later extreme scores. A more accurate method is to collect serial data regarding individuals’ average level of functioning over time and use this data to predict outcomes. Not only does this allow for greater predictive power for individuals, it allows for better interpretation of the data collected by screening. Second, these findings may reflect a “true” lack of stability in teacher reported internalizing symptoms over

time. Third, these findings may have identified a limitation of the SRS internalizing behavior scale. A review of the literature did not identify any studies that have examined continuity of teacher ratings of internalizing symptoms over time using the SSRS or SRS. Finally, the lack of continuity may be due, in part, to the use of extreme cut-points at all three time points. By using 2 SD as the cut-point at all three times, stability was defined as having a similarly elevated symptomatology over three or five years. An alternative, less restrictive definition might have described a group of children who exhibited extreme levels of internalizing symptomatology at kindergarten, but slightly less extreme levels three and five years later. Compared to children without elevated symptomatology at kindergarten, these children might still experience more symptoms for longer periods of time without meeting the 2 SD cut-off. Future research might consider different definitions of stability in order to ensure a higher percentage of at-risk students are identified.

*Elevated Internalizing Symptomatology as Predictor of Later Competency
and Self-Concept*

Overall, the current study failed to support the hypothesized relationships between kindergarten internalizing symptomatology and outcome variables (i.e., later competency and self-concept). This finding was unexpected and resulted in some of the planned tests of hypothesized mediators and moderators being modified or eliminated. Because the study's focus was on children who might be at risk for developing internalizing disorders, the predictor variable was dichotomized as indicating "typical" versus "elevated" symptomatology. Dichotomizing the predictors decreased their variability and likely, therefore, decreased the strength of the relationships between the predictors and the

dependent measures. Other research studies in the literature have used continuous measures of internalizing symptomatology and, therefore, may have found stronger relationships over time than were found in the present study.

Academic and Social Competence

Elevated internalizing symptomatology in kindergarten was not associated with later academic or social competency. This finding was not anticipated, as longitudinal studies have found that internalizing symptoms and academic difficulties in elementary school are related over time (e.g., Cole, 1990; Puura et al., 1998; Normandeau & Guay, 1998). In previous studies, however, the length of time between assessments was shorter than the one examined in the current study. For example, in the Normandeau and Guay study, kindergarteners' internalizing symptoms predicted poorer academic skills in first grade. While a strong association existed in the current study between competence and concurrent symptomatology, perhaps the time window of temporal influence of internalizing symptoms is shorter than could be identified in the relatively long time between assessments (i.e., three and five years).

It was also surprising that no longitudinal relationship was found in the social domain, given prior research that has found pre-existing depressive symptoms to predict self-confidence and positive school behaviors (e.g., Cole et al, 1999). Social functioning is closely tied with internalizing symptoms and interaction between these two domains would be expected to strengthen and perpetuate this association over time.

Supplemental analyses found that race/ethnicity had no effect on the temporal relationships between kindergarten internalizing symptomatology and later academic and social competency. That is, findings were consistent across different race/ethnicities.

Race/ethnicity x gender interactions also had no effect on the temporal relationships. The finding that demographic characteristics did not alter relationships in this study suggests that the same underlying mechanisms are present for all children, however, future research replicating this finding when significant temporal relationships are found would strengthen this interpretation.

Academic and Social Self-Concept

As with academic and social competence, elevated internalizing symptomatology in kindergarten was also not associated with later academic or social self-concept. This finding was not anticipated, as longitudinal studies have found that internalizing symptoms and self-concept are related over time (Cole et al., 1998). This was true for both genders and for children with differing degrees of kindergarten academic skill. As discussed in the previous section, perhaps temporal effects are shorter than the length of time between kindergarten and assessment of self-concept in this study (three and five years).

Regarding possible effects of race/ethnicity on the temporal relationships between kindergarten internalizing symptomatology and later academic and social self-concept, results of supplemental analyses were again consistent with those found for academic and social competence. That is, significant effects were not found and this finding was consistent across different race/ethnicities. Race/ethnicity x gender interactions also had no effect on the temporal relationships examined in the current study.

Study Limitations and Future Directions

While not a concern in the present study, a methodological issue that often arises in studies such as this one is the increased likelihood of family-wise error due to the large

number of comparisons necessary to address the study's questions. This might have resulted in increased risk of some significant findings occurring by chance, and falsely attributing findings to relationships that do not exist. There are several methods of adjusting for this issue. For example, it might have been addressed by applying the Bonferroni correction and assigning adjusted alphas to each comparison.

Some limitations are inherent when using archival data to address research questions for which the data were not originally collected. First, the creation of the independent variable depended upon dichotomization of continuous teacher ratings collected at one point in time. Use of multiple ratings over time or an alternative cut point may have resulted in different results. Furthermore, the cut point chosen (2 SD above the mean) resulted in two groups of significantly discrepant sizes. One concern when comparing groups of different sizes is that power is limited by the group with the smallest *n*. Even though the group sizes in this study are discrepant, the sizes of the elevated groups were large enough to conduct inferential statistics using the t-test for unequal sample sizes. Another approach to this concern might be drawing a random sample of "typical students" that matches in size the elevated group. While this may have addressed any concern with robustness of analyses, a significant amount of information would be lost perhaps reducing the ability to generalize results.

Second, the children classified as having "elevated internalizing symptomatology" were not formally diagnosed. The number of children diagnosed with an internalizing disorder, per parent report, is extremely small. At Time 2, 122 children (1.7%) had been diagnosed with an anxiety disorder and 44 (0.6%) with a mood disorder. Similarly, at Time 3, 129 children (1.6%) had been diagnosed with an anxiety disorder

and 72 (0.9%) with a mood disorder. This suggests that even the children identified as having extreme ratings in the current study were not comparable to the clinical population.

Third, use of archival data precluded use of measures more closely aligned with constructs of interest. The SSRS, from which the SRS was adapted, was developed to measure broad facets of internalizing behavior problems and does not differentiate among diagnostic subtypes. For example, symptoms of depression and symptoms of anxiety are both included on the internalizing problems subscale. This may have important implications for use of this measure in longitudinal research, as symptoms of internalizing disorders change over childhood. For example, anxiety is a more common internalizing symptom in early childhood while cognitive symptoms of depression typically emerge several years later. Groups of children at different developmental stages may both have elevated scores on the internalizing scale of the SRS while presenting with very different symptoms. In addition, the use of an adapted/non-published measure instead of a measure with published norms (e.g., BASC, CBCL) limits the ability to compare and interpret results. Furthermore, the characteristics described above raise concern regarding the sensitivity of the SRS Internalizing Scale in identifying students with internalizing behavior problems in the first place. It is comprised of items that describe a broad range of behaviors. The use of measures constructed for specific disorders (e.g., anxiety, depression) and for whom clinical norms have been established, would likely result in better identification of at-risk students. Future research allowing greater selection of sampling methodology and measures would counter many of the limitations of the current study.

In addition, the significant results documented in this study were correlational in nature. While describing relationships among the variables of interest, results could not contribute to our understanding of causal relationships between these variables. Future research using more sophisticated analytic procedures may allow for a more fruitful investigation of the ECLS-K data.

Finally, while this sample was generally representative of the US population, missing data may have affected external validity. Only children who had at least partial data at all three rounds were included in the study. To minimize the number of additional children excluded, pair-wise deletion of subjects was chosen over list-wise deletion. Other methods of dealing with missing data (e.g., maximum likelihood, multiple imputation, etc.) may increase generalizability of results. Prior to conducting future research with this dataset, it might be beneficial to conduct sensitivity analyses to select a more sophisticated approach to missing data. However, handling the distorting effects of missing data in the analysis of large data sets is a problem that has plagued many investigators over many decades. As there is a current lack of consensus among methodologists about how to estimate the magnitude and direction of these distorting effects, it is difficult to determine the appropriate adjustments regarding parameter estimates and effect sizes.

Implications for Practice

The measure of internalizing symptomatology used in the current study, the SRS Internalizing Behavior Scale, is adapted from the SSRS Internalizing Problems Scale. Teacher ratings of internalizing behavior as measured by this scale were very unstable from early to middle childhood, and only slightly more stable within the middle

childhood years. As discussed above, it is unclear to what extent findings reflect methodological limitations, a “true” instability of elevated internalizing symptomatology, or a limitation of the instrument. Future research might further our understanding regarding this issue. Regardless of the underlying reason, however, caution may be warranted when using the SSRS in applied settings to predict future functioning. While it may be a useful assessment of teachers’ current perceptions of a child’s internalizing symptoms, and allow for normative comparisons, predictions regarding internalizing symptomatology over time should not be made.

Some caution is warranted when using teacher ratings alone to screen for at-risk children. While benefits of using teachers as raters include more exposure to a variety of children with which to make comparisons and a better sense of typical age-appropriate behavior, some limitations exist. Specifically, teachers observe children in only one setting (school) and their attention is usually divided among many children at once. These factors may be especially problematic in identifying children with internalizing problem behaviors (e.g., withdrawal, worrying, etc.) as these may be less likely than other problem behaviors to elicit attention. The use of information from multiple raters (e.g., parents and teachers) and in multiple settings (e.g., home and school) would likely increase the accuracy with which children are identified, but is less practical in large-scale screenings.

The absence of significant differences among race/ethnicities in this study was unexpected given the literature documenting disproportionality of school behavior problems for African American and Hispanic students (Skiba et al, 2006). A possible explanation for this discrepancy is that the present study examined internalizing problem

behaviors which are much less likely to result in discipline referrals and likely do not contribute to the disproportionality.

The present study explored the relationships among distal variables (i.e., internalizing disorder symptoms and academic/social skills) to explain later academic self-concept. In the “ideal” study, several important family and school variables (e.g., parental support, family structure, classroom characteristics, etc.) and proximal child variables (achievement orientation, motivation, etc.) might be included. Each of these additional variables have been shown in the literature to be related to academic self-concept and perhaps accounting for their influence on internalizing behavior and competence would better explain the proposed relationships.

Children’s self-report of both internalizing and externalizing behavior problems was consistent with teacher ratings, suggesting that children in middle childhood are reliable reporters of their behavior problems. This finding supports the use of self-report measures as screening tools for behavior problems in childhood. Screening may be particularly important in identifying children with internalizing behavior problems, given that these children may be under-identified and less likely to receive intervention. Furthermore, this study found that children with increased internalizing symptomatology did not evidence pervasively negative self-assessments. If children experiencing internalizing symptoms are able to identify areas of relative strengths and weaknesses, then there is some support for the use of self-report measures to plan intervention and to assess treatment effects. This study sampled children from the general population, almost all of whom evidenced sub-clinical levels of symptomatology, and results should not be generalized to the clinical population.

Conclusions

The last decade has seen increased appreciation by scientists and policy-makers of the importance of early-identification and early-intervention for children at-risk for mental illness and underachievement (see Fox, Halpern, & Forsyth, 2008; Satcher, 2000). Research on resilience in childhood has shown that healthy self-concept is a powerful protective factor. Positive self-concept is associated with many positive outcomes including increased social skills, higher academic achievement, and fewer behavior problems (Atkins-Burnett & Meisels, 2001). Children exhibiting internalizing symptomatology (i.e., depression, anxiety, somatization, and withdrawal) may especially benefit from intervention as the presence of these symptoms interfere with normal development of self-concept and school competence. Unfortunately, up to 75% of anxious and depressed youth do not receive treatment (Fox et al., 2008). Results of the current study provide additional evidence that children exhibiting internalizing symptoms, even within a non-referred sample, are in need of intervention. Elevated internalizing symptomatology in early and middle childhood was associated with decreased functioning in several important domains (i.e., academic, social, and behavior).

Depression and anxiety are present in the elementary school-age population at rates of 2-3 percent and 13 percent, respectively (NAMI, 2009). The presence of these disorders in childhood is associated with long-term negative outcomes. For example, there is a high-rate of recurrence for children diagnosed with an internalizing disorder and higher than expected rate of co-morbidity with other mental illnesses (Kovacs & Devlin, 1998; McConaughy & Skiba, 1993). Less is known about the outcomes of non-referred children (i.e., children who present with symptoms, but who have not been

diagnosed or treated). Longitudinal studies are necessary to understand the developmental trajectory of at-risk children and to identify both risk and resiliency factors. No previous studies have been found that utilized the ECLS-K to explore longitudinally the development of children presenting with internalizing symptoms at school entry. While results of longitudinal analyses in the current study were largely not significant, future studies employing different analytic strategies to study the developmental trajectory of early behavioral concerns may yet find this dataset applicable.

Appendix

Table A.1

*Summary of Hierarchical Regression Analysis for Variables Predicting Time 2
Reading Competence*

Variable	B	SE B	β
Step 1			
Gender	.21	.05	.10***
Time 2 Internalizing Symptomatology	-.31	.02	-.31***
Step 2			
Gender	.13	.03	.10***
Time 2 Internalizing Symptomatology	-.32	.02	-.31***
Kindergarten Internalizing Status	.07	.14	.01

Note. $R^2 = .12$ for Step 1; $\Delta R^2 = .00$ for Step 2. *** $p < .001$.

Table A.2

*Summary of Hierarchical Regression Analysis for Variables Predicting Time 2
Math Competence*

Variable	B	SE B	β
Step 1			
Gender	-.10	.05	-.05
Time 2 Internalizing Symptomatology	-.29	.02	-.29***
Step 2			
Gender	-.10	.05	-.05
Time 2 Internalizing Symptomatology	-.29	.03	-.29***
Kindergarten Internalizing Status	.08	.15	.01

Note. $R^2 = .09$ for Step 1; $\Delta R^2 = .00$ for Step 2. * $p < .05$ *** $p < .001$.

Table A.3

*Summary of Hierarchical Regression Analysis for Variables Predicting Time 2
Social Competence*

Variable	B	SE B	β
Step 1			
Gender	.35	.05	.17***
Time 2 Internalizing Symptomatology	-.40	.02	-.40***
Step 2			
Gender	.35	.05	.17***
Time 2 Internalizing Symptomatology	-.40	.02	-.40***
Kindergarten Internalizing Status	-.14	.14	-.02

Note. $R^2 = .02$ for Step 1; $\Delta R^2 = .00$ for Step 2. *** $p < .001$.

Table A.4

*Summary of Hierarchical Regression Analysis for Variables Predicting Time 3
Reading Competence*

Variable	B	SE B	β
Step 1			
Gender	.27	.04	.14***
Time 2 Internalizing Symptomatology	-.32	.02	-.32***
Step 2			
Gender	.27	.04	.14***
Time 2 Internalizing Symptomatology	-.32	.02	-.32***
Kindergarten Internalizing Status	-.22	.12	-.04

Note. $R^2 = .13$ for Step 1; $\Delta R^2 = .00$ for Step 2. *** $p < .001$

Table A.5

*Summary of Hierarchical Regression Analysis for Variables Predicting Time 3
Math Competence*

Variable	B	SE B	β
Step 1			
Gender	-.02	.06	-.01
Time 2 Internalizing Symptomatology	-.25	.03	-.26***
Step 2			
Gender	-.02	.06	-.01
Time 2 Internalizing Symptomatology	-.24	.03	-.25***
Kindergarten Internalizing Status	-.23	.16	-.05

Note. $R^2 = .07$ for Step 1; $\Delta R^2 = .00$ for Step 2. *** $p < .001$

Table A.6

*Summary of Hierarchical Regression Analysis for Variables Predicting Time 3
Social Competence*

Variable	B	SE B	β
Step 1			
Gender	.43	.04	.22***
Time 2 Internalizing Symptomatology	-.37	.02	-.37***
Step 2			
Gender	.43	.04	.22***
Time 2 Internalizing Symptomatology	-.37	.02	-.37***
Kindergarten Internalizing Status	-.22	.19	-.04

Note. $R^2 = .19$ for Step 1; $\Delta R^2 = .00$ for Step 2. *** $p < .001$

Table A.7

*Summary of Hierarchical Regression Analysis for Variables Predicting Time 2
Reading Self-Concept*

Variable	B	SE B	β
Step 1			
Gender	.21	.05	.11***
Time 2 Internalizing Symptomatology	-.07	.03	-.07**
Step 2			
Gender	.21	.05	.11***
Time 2 Internalizing Symptomatology	-.07	.03	-.07***
Kindergarten Internalizing Status	-.01	.14	-.00

Note. $R^2 = .02$ for Step 1; $\Delta R^2 = .00$ for Step 2. *** $p < .001$.

Table A.8

*Summary of Hierarchical Regression Analysis for Variables Predicting Time 2
Math Self-Concept*

Variable	B	SE B	β
Step 1			
Gender	-.32	.05	-.16***
Time 2 Internalizing Symptomatology	-.06	.02	-.06*
Step 2			
Gender	-.32	.05	-.16***
Time 2 Internalizing Symptomatology	-.06	.03	-.06*
Kindergarten Internalizing Status	.1	.14	.02

Note. $R^2 = .03$ for Step 1; $\Delta R^2 = .00$ for Step 2. * $p < .05$ *** $p < .001$.

Table A.9

*Summary of Hierarchical Regression Analysis for Variables Predicting Time 2
Social Self-Concept*

Variable	B	SE B	β
Step 1			
Gender	.07	.05	.04
Time 2 Internalizing Symptomatology	-.12	.02	-.12***
Step 2			
Gender	.07	.05	.04
Time 2 Internalizing Symptomatology	-.12	.02	-.12***
Kindergarten Internalizing Status	-.03	.14	-.01

Note. $R^2 = .02$ for Step 1; $\Delta R^2 = .00$ for Step 2. *** $p < .001$.

Table A.10

*Summary of Hierarchical Regression Analysis for Variables Predicting Time 3
Reading Self-Concept*

Variable	B	SE B	β
Step 1			
Gender	.30	.05	.15**
Time 3 Internalizing Symptomatology	-.06	.02	-.06*
Step 2			
Gender	.30	.05	.15**
Time 3 Internalizing Symptomatology	-.06	.02	-.06*
Kindergarten Internalizing Status	.12	.13	.02

Note. $R^2 = .03$ for Step 1; $\Delta R^2 = .00$ for Step 2. * $p < .05$ ** $p < .01$

Table A.11

*Summary of Hierarchical Regression Analysis for Variables Predicting Time 3
Math Self-Concept*

Variable	B	SE B	β
Step 1			
Gender	-.24	.05	-.12***
Time 3 Internalizing Symptomatology	-.12	.02	-.12***
Step 2			
Gender	-.24	.05	.12***
Time 3 Internalizing Symptomatology	-.12	.02	-.12***
Kindergarten Internalizing Status	.16	.13	.03

Note. $R^2 = .03$ for Step 1; $\Delta R^2 = .00$ for Step 2. *** $p < .001$.

Table A.12

*Summary of Hierarchical Regression Analysis for Variables Predicting Time 3
Social Self-Concept*

Variable	B	SE B	β
Step 1			
Gender	.19	.04	.10***
Time 3 Internalizing Symptomatology	-.17	.02	-.17***
Step 2			
Gender	.19	.04	.10***
Time 3 Internalizing Symptomatology	-.18	.02	-.18***
Kindergarten Internalizing Status	.17	.13	.03

Note. $R^2 = .04$ for Step 1; $\Delta R^2 = .00$ for Step 2. *** $p < .001$.

Table A.13

Summary of Multiple Regression Analysis for Kindergarten Reading Competency as Moderator of Internalizing Status and Time 2 Self-Concept

Variable	B	SE B	β
Gender	.17	.04	.08***
Kindergarten Internalizing Status	-.62	.54	-.11
Kindergarten Reading Competency	.13	.02	.13***
K Internalizing Status x Reading Competency	.26	.18	.14

Note. $R^2 = .03$, $F(4,2102) = 16.05$, $p < .001$.

Table A.14

Summary of Multiple Regression Analysis for Kindergarten Reading Competency as Moderator of Internalizing Status and Time 3 Self-Concept

Variable	B	SE B	β
Gender	.25	.04	.12***
Kindergarten Internalizing Status	.40	.54	.07
Kindergarten Reading Competency	.16	.02	.16***
K Internalizing Status x Reading Competency	-.06	.18	-.03

Note. $R^2 = .05$, $F(4,2100) = 25.07$, $p < .001$. *** $p < .001$

Table A.15

Summary of Multiple Regression Analysis for Kindergarten Math Competency as Moderator of Internalizing Status and Time 2 Self-Concept

Variable	B	SE B	β
Gender	-.29	.04	-.15***
Kindergarten Internalizing Status	.37	.49	.07
Kindergarten Math Competency	.03	.03	.03
K Internalizing Status x Math Competency	-.08	.15	-.05

Note. $R^2 = .02$, $F(4,2096) = 12.06$, $p < .001$. *** $p < .001$

Table A.16

Summary of Multiple Regression Analysis for Kindergarten Math Competency as Moderator of Internalizing Status and Time 3 Self-Concept

Variable	B	SE B	β
Gender	-.21	.04	-.10***
Kindergarten Internalizing Status	.61	.50	.11
Kindergarten Math Competency	.11	.03	.10***
K Internalizing Status x Math Competency	-.15	.15	-.09

Note. $R^2 = .02$, $F(4,2093) = 10.12$, $p < .001$. *** $p < .001$

Table A.17

*Summary of Multiple Regression Analysis for Kindergarten Social Competency
as Moderator of Internalizing Status and Time 2 Self-Concept*

Variable	B	SE B	β
Gender	.11	.04	.05*
Kindergarten Internalizing Status	.60	.49	.11
Kindergarten Social Competency	.15	.04	.09***
K Internalizing Status x Social Competency	-.20	.19	-.09

Note. $R^2 = .01$, $F(4,2091) = 6.70$, $p < .001$. * $p < .05$ *** $p < .001$

Table A.18

*Summary of Multiple Regression Analysis for Kindergarten Social Competency
as Moderator of Internalizing Status and Time 3 Self-Concept*

Variable	B	SE B	β
Gender	.18	.04	.09***
Kindergarten Internalizing Status	.87	.49	.15
Kindergarten Social Competency	.24	.04	.15***
K Internalizing Status x Social Competency	-.25	.19	-.11

Note. $R^2 = .03$, $F(4,2102) = 6.70$, $p < .001$. *** $p < .001$

Table A.19

Crosstabulation of Gender x Internalizing Behavior for Different Race/Ethnicities at T1

Race/Ethnicity (n = 8653)	Internalizing Behavior		X^{2a}	p
	Typical	Elevated		
White				
Male	2591 (51.3%)	80 (49.4%)	.02	.88
Female	2464 (48.7%)	82 (50.6%)		
Black or African American, nonhispanic				
Male	590 (50.3%)	30 (63.8%)	.76	.38
Female	582 (49.7%)	17 (36.2%)		
Hispanic				
Male	722 (47.4%)	39 (69.6%)	3.2	.07
Female	800 (52.6%)	17 (30.4%)		

Note. Significance test for 3-way interaction (Race/Ethnicity x Gender x Internalizing Behavior) was also non-significant, $G^2(7, N = 8653) = 5.36, p = .62$. ^adf = 1. Adjusted standardized residuals appear in parentheses below group frequencies.

Table A.20

Crosstabulation of Gender x Internalizing Behavior for Different Race/Ethnicities at T2

Race/Ethnicity (n =6999)	Internalizing Behavior		X ^{2a}	P
	Typical	Elevated		
White				
Male	2150 (49.7%)	68 (57.1%)	.91	.34
Female	2178 (50.3%)	51 (42.9%)		
Black or African American, nonhispanic				
Male	391 (46.3%)	36 (64.3%)	1.7	.19
Female	454 (53.7%)	28 (35.7%)		
Hispanic				
Male	497 (44.3%)	33 (62.3%)	1.5	.22
Female	626 (55.7%)	20 (37.7%)		

Note. Significance test for 3-way interaction (Race/Ethnicity x Gender x Internalizing Behavior) was also non-significant, $G^2(7, n =6999) = 14.02, p = .051$. ^adf = 1. Adjusted standardized residuals appear in parentheses below group frequencies.

Table A.21

Crosstabulation of Gender x Internalizing Behavior for Different Race/Ethnicities at T3

Race/Ethnicity (n = 8232)	Internalizing Behavior		X^{2a}	P
	Typical	Elevated		
White				
Male	2348 (49.9%)	128 (62.1%)	2.81	.09
Female	2354 (50.1%)	78 (37.9%)		
Black or African American, nonhispanic				
Male	547 (46.6%)	17 (32.7)	1.29	.26
Female	626 (53.4%)	35 (67.3)		
Hispanic				
Male	713 (48.4%)	29 (58.0%)	.47	.50
Female	759 (51.6%)	21 (42.0)		

Note. Significance test for 3-way interaction (Race/Ethnicity x Gender x Internalizing Behavior) was also non-significant, $G^2(7, N = 8232) = 7.70, p = .36$. ^adf = 1. Adjusted standardized residuals appear in parentheses below group frequencies.

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