

ABSTRACT

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CONSTRUCTIONS AND THE CURIOUS CASE
OF THE COMPARATIVE CORRELATIVE

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Comparative correlatives, like *the longer you stay out in the rain, the colder you'll get*, are prolific in the world's languages (i.e., there is no evidence of a language that lacks comparative correlatives). Despite this observation, the data do not present a readily apparent syntax. What is the relationship between the two clauses? What is the main verb? What is English's *the* which obligatorily appears at the start of each clause?

This thesis reviews prior analyses of comparative correlatives, both syntactic and semantic (Fillmore, 1987; McCawley, 1988; McCawley, 1998; Beck, 1997; Culicover & Jackendoff, 1999; Borsley, 2003; Borsley, 2004; den Dikken, 2005; Abeillé, Borsley & Espinal, 2007; Lin, 2007). A formal syntactic analysis of comparative correlatives is presented which accounts for its syntactic behaviors across several languages. Most notably, it challenges the assumption that constructions are essential primitives for the successful derivation and interpretation of the data (Fillmore, 1987; McCawley, 1988; Culicover & Jackendoff, 1999; Borsley, 2003; Borsley, 2004; Abeillé, Borsley & Espinal, 2007). The analysis is framed within the goals of the Minimalist Program (Chomsky 1993, 1995a), specifically with respect to endocentricity and Bare Phrase Structure (Chomsky 1995b).

Crosslinguistically, the first clause is subordinate to the second clause, the main clause. A'-movement (e.g., Topicalization, *wh*-movement, Focus) out of each clause proceeds successive-cyclically and, in the case of the subordinate clause, via sideward movement (Nunes 1995, 2004; Hornstein, 2001). In English, the word *the* which obligatorily appears at the start of each clause in English is a Force⁰. This provides an explanation for the ban on Subject-Aux Inversion (SAI) in the entire expression. The degree phrases which are present in each clause of a comparative correlative crosslinguistically contain a quantifier phrase in Spec,DegP; this quantifier is phonetically null in English.

This thesis concludes by presenting conceptual arguments against constructions as primitives in the grammar. Bare Phrase Structure (BPS) (Chomsky, 1995b) is included in the system by virtue of virtual conceptual necessity (VCN). Since constructions do not meet the criteria of VCN, their existence would compromise the principles of BPS. Further, when applied carefully, BPS renders constructions unable to be defined.

Grammar Deconstructed:
Constructions and the Curious Case of the Comparative Correlative

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Dedication

This dissertation is dedicated to the memory of Jackie Cochran, a woman who never crashed and burned. Indeed, she was a woman of many talents who rose up after facing personal tragedy and who moved on in life to explore new possibilities. She became an undisputed leader in her field, independent of her gender. One of her more notable accomplishments came when she was 47 years old. She set a standard that I cannot possibly achieve, but can always strive to reach.

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*I'm trying to tell you something about my life
Maybe give me insight between black and white
The best thing you've ever done for me
Is to help me take my life less seriously, it's only life after all
Well darkness has a hunger that's insatiable
And lightness has a call that's hard to hear
I wrap my fear around me like a blanket
I sailed my ship of safety till I sank it, I'm crawling on your shores*

*I went to the doctor, I went to the mountains
I looked to the children, I drank from the fountains
There's more than one answer to these questions
Pointing me in a crooked line
The less I seek my source for some definitive
The closer I am to fine*

Excerpt from *Closer to Fine*, music and lyrics by Amy Ray & Emily Saliers

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Chapter 1 Introduction

1. What is a comparative correlative?

This thesis concerns comparative correlatives and what contribution the data make to the theory of grammar. Comparative correlatives have been addressed by only a handful of theoreticians, and the impact of this data on the developing theory of grammar has consequently been small. Since comparative correlatives are not well-known data in formal linguistics, we'll begin by giving a few examples of this type of expression in English, in (1)-(4) below.

- (1) The more apples you eat, the healthier you'll be
- (2) The more things change, the more they stay the same
- (3) The less irritable a child is, the more soundly she will sleep at night
- (4) The more thoroughly Jane prepares for her exam, the better she will score

There are many types of expressions that appear to be related to comparative correlatives, such as standard comparatives, standard "if-then" conditionals, correlatives, and several lesser known expression types, like inverted comparative correlatives, 'notational' comparatives, and 'and' conditionals (see (5)-(11) for examples of each). The relationship that each of these kinds of expressions has to comparative correlatives will be considered within this thesis. However, with so many related expressions, it becomes clear that the first order of business is to provide a descriptive definition of comparative correlatives in terms of their linguistic characteristics in order to distinguish them from the related expressions and to describe them in a specific enough way so as to capture the essential characteristics of the expression that appear crosslinguistically.

- (5) The more vegetables a girl eats, the taller she grows comparative correlative
- (6) The girl is taller than the boy standard comparative
- (7) If a girl eats her vegetables, then she will be tall standard conditional
- (8) Hindi correlative¹
 Jo laRkii khaRii hai vo lambii hai
REL girl standing is DEM tall is
 ‘Which girl is standing, that (one) is tall.’
- (9) A girl will grow taller, the more vegetables she eats inverted comparative correlative
- (10) A girl grows tall, the more vegetables she eats notational comparative
- (11) A girl eats her vegetables, and she’ll grow tall. ‘and’ conditional

The data used in developing the ideas in this thesis drew from a number of languages and language families, some previously documented and some investigated here for the first time. From this collection of data, comparative correlatives are identified as those expressions in a language that have the linguistic characteristics given in (12):

- (12) Characteristics of comparative correlatives
- a. A comparative correlative has a semantic interpretation that can be paraphrased as "the degree or amount of some quality, substance, or situation x is correlated in some way with the degree or amount of some quality, substance or situation y."
 - b. A comparative correlative consists of two clauses, the first of which behaves syntactically as subordinate to the second.
 - c. A comparative correlative exhibits some overt degree morphology or overt quantifier that scopes over degrees.
 - d. Crosslinguistically (though not found in all languages), it is not atypical to find non-canonical word order in each of the clauses of a comparative correlative.

In order to make these characteristics explicitly apparent, consider the comparative correlative in (1), *the more apples you eat, the healthier you’ll be*. The paraphrased semantic interpretation of this expression is “the amount of apples that you eat is

¹ Correlatives are attested in Aryan and Dravidian languages, as well as in Hungarian. There is not a clear case of correlatives as a strategy of relativization in English.

positively correlated with the degree of healthiness you will have.” In this paraphrase, *the amount of apples that you eat* satisfies the portion “the degree or **amount** of some quality, **substance**, or situation **x**;” *is positively correlated with* satisfies the portion “is correlated in some way with;” and *the degree of healthiness you will have* satisfies the portion “the **degree** or amount of some **quality**, substance or situation **y**.” Thus the semantic paraphrase criterion in (12)a is satisfied. More, of course, has been said about the meaning of these expressions and how that can be captured formally (e.g., Beck 1997; Lin 2007), and discussion of these formal semantic analyses is contained in this thesis. However for now, we’ll stick to this simplistic paraphrase here in this introduction since our purpose here is to familiarize ourselves with the data.

Next, the criterion in (12)b says that the expression consists of two and only two clauses, which can be seen as satisfied by the notation in (15). That two clauses are in the expression can be seen easily -- the first clause is *the more apples you eat* and the second is *the healthier you’ll be*. It can also be easily shown that the order of the two clauses is important for the semantic interpretation. If the order is reversed, the truth conditions of the expression change, as seen in the contrast between the semantic interpretation of the two expressions in (13) and (14). This observation suggests that the two clauses are not on an equal status structurally.

(13) The longer we stay at the party, the more we drink

(14) The more we drink, the longer we stay at the party

(15)	The more apples you eat,	the healthier you’ll be
	<i>first clause</i>	<i>second clause</i>
	<i>subordinate clause</i>	<i>main clause</i>

The determination of the first clause as subordinate and the second as the main clause requires the use of syntactic tests, preferably a collection of tests that have proven reliable through a large body of data. Much discussion will be dedicated to this topic in chapter II, §3.1.2 and §3.2.1 in order to extensively investigate this structural relationship, but for our purposes here we will use one test of matrixhood of a clause, tag questions, to see the contrast between the behavior of each clause. In comparative correlatives, tag questions are hosted on the second clause, and not the first, as seen in (16)-(18). In (16) we see the base sentence, the comparative correlative. If we want to tag this expression, we cannot tag the subject and tense of the first clause, as in (17). The gender-specific pronoun *he* requires the interpretation of the nominal to refer to the subject of the first clause, *Romeo*, yet this coreference results in an unacceptable expression. Conversely, if the subject of the tag is the pronoun *she* as in (18), forcing this coreference with the subject of the second clause, *Juliet*, the result is licit coreference and coindexation and an acceptable expression. From this test of matrixhood, it can be determined that the second clause is the main clause and the first clause cannot be. As such, the first clause is subordinate to the second (main) clause.

(16) The more pizza Romeo eats, the more disappointed Juliet becomes

(17) * The more pizza **Romeo** eats, the more disappointed Juliet becomes, doesn't **he**?

(18) ✓ The more pizza Romeo eats, the more disappointed **Juliet** becomes, doesn't **she**?

The third criterion in (12)c is that a comparative correlative exhibits some kind of overt degree morphology or overt quantifier that scopes over degrees. In the first clause of the expression in (1), we see the overt comparative morpheme *more*, a degree morpheme; in the second clause, a different instantiation of the comparative morpheme,

-er, also a degree morpheme, is overtly present. The last criterion given in (12)d is that the word order in each clause of the comparative correlative is non-canonical for the language under investigation. The canonical word order for English is SVO, and that word order is not preserved in the two clauses on the comparative correlative in (1). In the first clause, *apples* is logically understood as the object of the verb *eat*, yet it linearly precedes the subject of the clause, *you*. In the second clause, the adjectival predicate *healthier* (or *healthy*, if we abstract away from the comparative modification) which normally would follow the auxiliary + verb *will be*, precedes the subject of the clause, *you*.

As we would expect, there is crosslinguistic variation in how these criteria are satisfied, and even within languages we see variation in how these criteria are satisfied. The exercise we just went through of examining one specific English comparative correlative has served to demonstrate one way in which these criteria could be satisfied. By no means should we consider the ways in which English comparative correlatives satisfy these criteria as representative of what is typical crosslinguistically. The characteristics of comparative correlatives given in (12) were phrased with a level of abstraction necessary to capture what is observed crosslinguistically. For instance we can see this in the way each of the English examples in (1)-(2) is paraphrased. The first clause of (1) made use of “amount” whereas the second made use of “degree;” the first was an amount of a substance, whereas the second was a degree of a quality. If we were to instead paraphrase (2), *The more things change, the more they stay the same*, the first clause would need to be captured as the degree of a situation, namely “the degree to which things change.” The second clause in (2) uses the same degree of a situation, “the

degree to which things stay the same.” Some languages do not use the full range of these possibilities. If comparative correlatives were examined using only data from a language with a more limited set of possibilities with respect to semantic interpretation, the criterion in (12)a would have been too constrained to have accurately characterized the expression.

Differently from the semantic paraphrase criterion, English is a language that is very limited in the way it satisfies the morphological criterion in (12)c. In English, both clauses must contain an overt comparative morpheme, and that is the only option to satisfy this characteristic. In Hindi, we see that each clause includes an overt quantifier that scopes over degrees (19). In Japanese (20), the first clause, a subordinate clause, contains a degree morpheme *hodo* not associated with the comparative, and no degree morphology or quantifier exists in the second clause. If the defining characteristics of a comparative correlative with respect to degree morphology had been formed based only on English, the characteristics would have missed a larger generalization. By looking at comparative correlatives from the limited set of data from English, Hindi and Japanese, we already are able to see that the accurate characterization of what a comparative correlative is involves something more abstract than comparatives, such as degree or quantification over degrees.

- (19) Hindi
Jitnaa suuraj chamk-aa **utnii** (-hii) ThanD
how-much.MSG sun.M shine-PF *that.much.F(-only)* *cold.F*
 baRh-ii]]
increase-PF.F
 ‘The more the sun shone, the colder it got.’
den Dikken (2005)’s example (5)a

- (20) Japanese
 Tabere-ba taberu- **hodo** onaka-ga heru.
Eat- conditional eat- degree stomach decrease
 “The more I eat, the hungrier I feel.”

2. Comparative correlatives across languages and language families

As was just demonstrated in the previous subsection, developing a list of the traits that define what is and what is not a comparative correlative requires examination of data from various languages and language families. Outside the research presented in this thesis, comparative correlatives have been documented in a number of languages from various language families, including Hindi, French, Spanish, Latin, Modern English, Old English, Archaic English, German, Danish, Dutch, Swedish, Modern Hebrew, Bulgarian, Polish, Russian, Serbo-Croatian, Hungarian, Maltese, Berber, Khalkha Mongolian, Mandarin Chinese, Japanese, and Korean. This research leading to this thesis continued investigation of comparative correlatives in some of these languages, and in others not previously discussed, including Standard Arabic, Turkish, Basque, Malayalam, Italian, Portuguese (Brazilian), and Modern Greek. The full list of these languages in which comparative correlatives have been documented includes 30 languages across 10 language families. These languages, organized by language family, can be seen in Table 1, along with the references of documentation of each language in the literature. In Table 1, the languages which are listed in bold print are those for which a native speaker was

consulted as part of the research for this thesis. The languages which are listed as underlined are those which, to the best of my knowledge, comparative correlatives are not discussed elsewhere in the literature independent of this research.

Table 1 – Comparative correlatives documented across languages and language families

Afro-Asiatic:		Maltese (Beck, 1997) <u>Standard Arabic</u> Berber (den Dikken, 2005) Modern Hebrew (Beck, 1997)
Altaic:		<u>Turkish</u> Khalkha Mongolian (den Dikken, 2005)
Basque:		<u>Basque</u>
Dravidian:		<u>Malayalam</u>
Indo-European:	Romance:	<u>Spanish</u> (Abeillé, Borsley, & Espinal, 2006) <u>Italian</u> <u>Portuguese</u> (Brazilian and European) <u>French</u> (references in footnote) ² Latin (Michaelis, 1994; den Dikken, 2005)
	Germanic:	<u>English</u> (almost all literature on CCs) Old English (den Dikken, 2005) Archaic English (den Dikken, 2005) German (references in footnote) ³ Dutch (Beck, 1997; den Dikken, 2005) Danish (Beck, 1997) Swedish (Culicover & Jackendoff, 1999)
	Slavic:	<u>Russian</u> (Beck, 1997; den Dikken, 2005) Polish (Borsley, 2003; den Dikken, 2005) Bulgarian (Beck, 1997) Serbo-Croatian (den Dikken, 2005)
	Greek:	<u>Modern Greek</u>
Indo-Aryan:		<u>Hindi</u> (den Dikken, 2005)
Japanese:		<u>Japanese</u> (den Dikken, 2005)
Korean:		<u>Korean</u> (Beck, 1997)
Sino-Tibetan:		<u>Mandarin Chinese</u> (McCawley, 1988; Lin 2007)
Uralic:		<u>Hungarian</u> (Beck, 1997; den Dikken, 2005)

In addition to this list of languages, there is anecdotal evidence, although it has not been documented at this time, that comparative correlatives are part of the grammar and productive in both Italian Sign Language and Pirahã. I include this fact in order to show

² Beck 1997; den Dikken, 2005; Abeillé, Borsley & Espinal, 2006

³ McCawley, 1988; Beck, 1997; Roehrs, Sprouse, & Wermter 2002; Den Dikken, 2005

that comparative correlatives are limited neither by the modality of a language (spoken or signed), nor by the degree to which a language is used in the world (i.e., colonial languages versus indigenous languages, major languages versus endangered). Far more striking than the number and diversity of languages and language families in which comparative correlatives have been documented is the following fact: there is no language for which I consulted with a native speaker in which comparative correlatives do not occur, nor is there any report in the literature of a language lacking them documented thus far. The diversity of languages for which comparative correlatives have been documented taken together with the lack of a known language that has been documented to lack them strongly suggests that comparative correlatives are not something unusual in a language. Put differently, if a language were found that lacked comparative correlatives, this should be as surprising as finding a language that lacked a strategy for relativization or noun modification. This conclusion leads us to the question, what role should comparative correlatives play in a theory of grammar? The answer is, comparative correlatives should play as much of a role in the theory of grammar as any other data in a language – they must be accounted for while an explanation for other data in the language is also maintained. This is the crux of what this thesis strives to provide.

3. Two large theoretical issues surrounding comparative correlatives

Two large theoretical issues have played a prominent role in the research on comparative correlatives, both those which use the data as a primary object of inquiry and those which use it as a secondary or tangential object of inquiry. The first of these issues is determining to what extent linguistic data can be classified as ‘core’ and ‘peripheral’ data, and, if such a distinction exists, whether the classification a type of expression has

should play any role in how they are investigated. If one assumes that the distinction exists, comparative correlatives are peripheral data, not usually taken into consideration when developing a formal theory of grammar, and, in fact, largely ignored. They receive this classification because an analysis of the data is not readily apparent, thus leading to their paucity in the literature.

The second theoretical issue that is pervasive throughout the syntactic literature on comparative correlatives is the role of constructions as primitives in a model of grammar. Comparative correlatives are used as a prime example of the type of data that cannot be explained, nor can they exist in human language, unless it is accepted as a premise that sentential and phrasal constructions are primitives in the grammar. The alternative to this premise would be that all of the syntactic behaviors and semantic interpretation of comparative correlatives (and all expressions in human language) are able to be derived by combining individual parts which are no larger than the single syntactic head.

I will briefly address both of the issues here, starting with the classification of comparative correlatives as peripheral data. As we have already seen, comparative correlatives are not at all unusual across the world's languages. Further, there is no research that investigates what the frequency of comparative correlatives is in natural language. Thus classifying the data as peripheral based on their crosslinguistic prevalence or on their frequency appears, at best, unsubstantiated, and perhaps, at worst, false. The classification as peripheral though, usually addresses a more discipline-specific observation, that is, that a collection of data have not been investigated or analyzed within a formal linguistic model, and therefore are perceived as unimportant in further

developing said model. It is this characterization of comparative correlatives that earns it the label ‘peripheral’ and merits discussion of this issue in the literature.

The approach that is taken in this thesis is that all data in a language are relevant in developing a model of the grammar of that language. Further, if a type of expression that appears in many different languages across language families, such an expression type is relevant data to investigate in developing a model of human language, independent of the specific language. However, as will become more apparent in chapter II of this thesis, the syntactic behaviors of comparative correlatives are not easily explained. For instance, what is the word *the* that obligatorily appears at the start of each clause in English? Does the presence of a comparative morpheme in each clause in English mean that a comparison is taking place in the same way as occurs in standard phrasal or nominal comparatives? These questions and more like them serve as stumbling blocks along the way to an explanation that accounts for the full range of behaviors of the data. Chapter III of this thesis contains the proposed analysis based on the collection of data considered. The analysis is framed within the assumptions of the minimalist program (Chomsky 1993, 1995a) and, as most analyses do, relies heavily upon previously established portions of syntactic theory based on ‘core’ data, such as constraints on and characteristic behaviors of A’-movement, locality conditions, complementizer-trace effect, the syntactic structure of degree phrases, the relationship between the two clauses of a standard conditional, and investigation of the CP domain. If various analyses of these phenomena had not yet been investigated and an explanation for them had not yet been proposed, formulating an analysis of comparative correlatives would have been incomplete. In this way, the research on these other ‘core’ data paved the way for an

analysis of comparative correlatives. The analysis here is not unique in this regard, or even unusual. As is the case with all theoretical models, the model of grammar is developed step by step, taking previous work into account when developing new parts of it. The newest proposals always benefit from that which went before them. Chapter II of this thesis reviews the literature on comparative correlatives and shows that each of the analyses has drawn upon previously established research to arrive at the proposed explanation, regardless of the theoretical framework the proposal was made within. Given this, it is neither surprising nor a shortcoming of the theoretical community as a whole that comparative correlatives have not received a more central role in the literature. There are other examples of data that, at the time of their first investigation and analyses, were no doubt considered ‘peripheral,’ but as a result of continuing research, they have played an important role in the development of the theory of grammar.⁴ As the theory continues to be built over time, it may be the case that comparative correlatives become more prevalent in the literature as their properties come to be understood better in relation to the rest of language.

With respect to the role of constructions in language, this will be a primary focus of discussion in chapters II and IV of this thesis. In chapter II, in which the literature on comparative correlatives is reviewed, we will see that comparative correlatives are often analyzed as data that cannot be accounted for without assuming the existence of sentential and phrasal constructions as primitives of the grammar, and essential for every derivation (Fillmore, 1987; McCawley 1988; Culicover & Jackendoff, 1999; Borsley

⁴ Some examples are multiple wh-questions, superiority effects, parasitic gaps, and antecedent contained deletion. The list could be much longer, but I think this sampling suffices to support the point.

2003, 2004; Abeillé, Borsley & Espinal, 2006). The analysis proposed in chapter III does not appeal to such constructions, instead relying upon the individual heads and rules of combinatorics applying to those heads in order to explain the syntactic structure and semantic interpretation of the expression. This leads to a larger question, which is the focus of chapter IV: does a grammar that does not require sentential and phrasal constructions also prohibit the existence of such constructions? The discussion in that chapter appeals to principles of cognition like chunking (Miller, 1956) and information retrieval. Since the larger issue of “constructions versus no constructions” is discussed thoroughly throughout this thesis, we will leave it here without further elaboration.

4. Some last notes, and the plan for this thesis

I digress briefly for a clarification regarding names of these data as they have existed in the literature historically. Comparative correlatives have gone by a myriad of labels in the literature, including *comparative conditionals/conditional comparatives*, “*the X-er...the Y-ers*”, *double comparatives*, and *the...the comparative constructions*. The name for the type of expression, *comparative correlative*, was coined by Culicover & Jackendoff (1999) and since then has largely been adopted as the consistently used label for the data. In order to avoid any confusion, I use the term *comparative correlative* throughout this thesis to refer to the data.

The theoretical discussion in this thesis touches upon many different frameworks of generative grammar, including Construction Grammar (as proposed by Fillmore, Kay and Lakoff in various publications in the 1980s, such as Lakoff & Johnson (1980), Fillmore (1985), Fillmore, Kay and O’Connor (1988), Kay (1990), Lakoff (1987), Lakoff (1989), and Kay & Fillmore (1994)), Head-Driven Phrase Structure Grammar (HPSG),

the model of “Simpler Syntax” as proposed by Culicover & Jackendoff (1999) and in previous works by these authors, and the Minimalist Program (Chomsky 1993, 1995a). One of the goals of this thesis is to propose an analysis of comparative correlatives within the assumptions of the minimalist program that accounts for the full range of syntactic behaviors of the data. Given this goal, it would be a small step further to conclude that such an analysis provides evidence against other theoretical frameworks. However, this is not a step that is logically supported, nor is it a step I take. In no way does this thesis set as its goal to prove or disprove any specific theoretical framework for language. The question of whether a large set of theoretical assumptions is tenable cannot be determined on the basis of one set of data. While it is the case that a specific analysis of a data set can be shown to have flaws, it is not the case with comparative correlatives that any of the flaws of a specific analysis lead to the rejection of an entire theoretical approach to syntax. It is the case that comparative correlatives have been claimed to be such data which demonstrate that minimalism and/or a theory that is UG constrained cannot be correct; the analysis I propose in this thesis demonstrates that this claim is incorrect. Comparative correlatives can be derived and their behaviors accounted for within a minimalist framework.

Beyond this goal, through the analysis presented here, this research strives to incorporate comparative correlatives into the larger grammar, showing that their behaviors are similar to other, more well-known data, rather than dissimilar. Lastly, comparative correlatives provide evidence for new hypotheses with the theory, such as the existence of overt C-heads in matrix clauses for instance.

The content of the following chapters of this thesis is as follows: Chapter II is an extensive review of the literature on comparative correlatives, both syntactic and semantic. This chapter presents a large body of data and the conclusions that have been drawn based on that data by various theoreticians. Where appropriate and necessary, those conclusions are tested with new data and reformulated. The data cover a range of languages, and this chapter is concluded with a summary of the data in a more concise fashion. In Chapter III, based on the data already reviewed in the previous chapter and on new data collected through this research, the proposal for a formal syntactic analysis of comparative correlatives is presented. The analysis is presented using English data, and then extended to show that it can also account for data in Hindi, Greek, and Portuguese. One key part of the analysis is that the word *the* that obligatorily appears at the start of each clause of a comparative correlative is not the definite determiner, but rather a complementizer, and the head of each clause. The evidence for this somewhat unusual proposal, as well as an extension of this proposal to other data in English will also be provided. Also included in this analysis is an extensive discussion of the obligatory degree morphology or quantifier that scopes over degrees. It is proposed that a degree head in each clause serves as the head of a degree phrase, one which undergoes A'-movement triggered in part by a functional head. The discussion in chapter IV leaves the 'nuts and bolts' of the syntactic analysis behind and ventures into a more conceptual issue – the existence of sentential and phrasal constructions in a minimalist grammar. The discussion focuses on the defining contrast between grammars that rely upon constructions as primitives and those that reject the use of constructions in favor of a lexicon comprised only of individual heads: endocentricity. Drawing from the principles

of bare phrase structure (Chomsky, 1995b) and the necessarily endocentric grammar which follows from this principle, it is concluded that even if constructions are able to exist in a grammar, they do not have a place in a “bottom-up, head-only” grammar.

Moving on then.

Chapter II Literature Review and Amassing of the Empirical Data

1. Introduction

Comparative correlatives have been analyzed in several various theoretical frameworks. In each of these frameworks, the data are argued to give support for its own theoretical apparatus and, by the same token, provide evidence against other broader theoretical assumptions. One of the central theoretical arguments concerning these data is the existence of phrasal and sentential constructions as primitives in the grammar. Most linguists agree on the generalization that Language is made of parts; the smallest of these parts that the syntax and semantics can use are single morphemes and words. However, there is some question as to whether parts bigger than this exist. Specifically, Construction Grammar (CxG) and those theoretical frameworks which follow the traditions of CxG assume that structures as large as a phrase (phrasal constructions) and as large as a sentence (sentential constructions) are needed for phrases and sentences to exist in Language. A phrasal or sentential construction has the syntactic structure of the specific type of phrase or sentence being built, including specification for features that certain terminal nodes must possess. In short, a phrase or sentence can only be derived in Language if there is a phrasal or sentential construction available to include in the derivation. This approach contrasts with one that assumes that such syntactic objects are not necessary.

It would be a gross overstatement to suggest that all theoretical frameworks that make use of phrasal and/or sentential constructions have the same reasons for choosing this way of encoding structural information. On one end of the construction-theoretic spectrum, Language is proposed to be first and foremost a communicative system and the

learner/user of that system is seeking a method by which to capture and convey meaning of that which is perceived in the world around them (i.e., Goldberg, 1995; 2006). Under this view, the strings of words that make up phrases and sentences need to fit into a template of sorts, so the learner hypothesizes such a template (sentential or phrasal construction) and then new utterances are created or parsed according to this template. The learner arrives at the correct template by means of statistical learning alone. In this way, the use of constructions in the grammar is essential in order to eliminate the need to rely upon biology or innate knowledge about language. On the other end of this spectrum is the use of constructions in a generative grammar, such as in CxG as it was first conceptualized or as in HPSG. Rather than setting as theoretical goals the elimination of any role of biology from the system that is language, this perspective utilizes constructions as a way to encode structural information in the most concise and reliable way. For instance, if a type of structure is seen crosslinguistically with only minor variation, it would stand to reason that an abstract template for that structure is part of what the learner brings to the language learning task ‘for free.’ For example, crosslinguistically conditionals consist of two clauses, a subordinate clause and a main clause. A conditional construction then would encode the necessity of these two clauses, and the features of specific heads within those clauses, as part of genetically-endowed information. The language learner has the task of figuring out what the variations of that construction are within the language they are learning, such as determining the permissible order(s) of the two clauses, or what lexical items can/must fill certain positions of the construction.

In contrast to a theoretical model that assumes the necessity of phrasal and sentential constructions, a theoretical model of grammar that does not rely upon constructions as primitives, such as minimalism, must place the weight of the system upon features encoded on individual syntactic heads, reliable rules of combinatorics, and innate knowledge of these two to some extent. Minimalism places a premium on positing only those primitives that satisfy the criteria of virtual conceptual necessity (Chomsky, 1993). Such a primitive is the idea that phrase labels do not differentiate in any way from one of the heads that is contained within that phrase, i.e., bare phrase structure (Chomsky, 1995b). Such a system is necessarily endocentric, unlike construction grammars. This does not diminish or exclude the role of natural language heard by the learner (primary linguistic data, or *PLD*), nor the role of statistical learning; both are essential to such a system. However, with respect to phrasal and sentential constructions, the hypothesis that minimalism continually tests is that a system that contains many idiosyncratic lexical and functional heads (essential for any model of grammar) and a few rules for combining heads is the simplest system for language. If it can be shown that a grammar can achieve descriptive and explanatory adequacy with these minimal requirements, then eliminating constructions from the grammar is a preferable theoretical step.

The commonality held as a guiding principle in all of these broad theoretical frameworks is the general scientific goal of accounting for the data in the most complete and simplest way, accounting for the full range of data, as well as taking into account theoretically conceptual issues. They contrast in the specific implementation of this principle, of course. In a “communicative-system”-type construction grammar, sentential constructions are by-products of a system trying to organize probabilistic data. In

contrast, in model of grammar that adheres to the principles laid out in the Minimalist Program, primitives like heads are assumed along with innate language learning abilities, rendering the sentential constructions as redundant and more efficiently coded in the grammar through features on individual heads. The analysis of comparative correlatives which will be presented in chapter III, following the present one, is framed within the minimalist program. I take the tenets of minimalism, specifically with respect to bare phrase structure, to best satisfy the criteria of most fully explaining the empirical data while simultaneously striving to maintain the fewest number of stipulations possible. Further, the minimalist program is able to appeal to a broad array of conceptual considerations without compromising its explanatory adequacy. I will spend little time in this thesis defending this claim since much has already been said in the literature about its validity and viability.

Comparative correlatives are first mentioned by Ross (1967:406) with a single example noting that a variable must be part of the expression because the first clause (not identified by Ross as such) is sensitive to islands such as the Complex Noun Phrase Constraint (CNPS), the Coordinate Structure Constraint (CSC) and the Specified Subject Condition (SSC). There is no mention of the data in the theoretical literature again until Fillmore (1987). Fillmore (1987), followed by McCawley (1988) begin the analysis of comparative correlatives in modern generative grammar, and argue that comparative correlatives (termed “BCHF” constructions by Fillmore and “comparative conditionals” by McCawley)⁵ are best analyzed within a framework that assumes the existence of

⁵ In order to eliminate any confusion, the data under investigation in this thesis are referred to as “comparative correlatives” throughout, regardless of what name they have gone by in prior literature.

sentential constructions. Beginning with Culicover & Jackendoff (1999), the data gain their current label, “comparative correlative.” Culicover & Jackendoff present the data as best analyzed in a theoretical framework that allows for different structures at different levels of analysis. Most importantly, they strive to show that the data demonstrate the need for distinct semantic and syntactic structures. In a series of papers, Borsley (2003, 2004) and Abeillé, Borsley and Espinal (2006) analyze comparative correlatives in Polish, English, Spanish, and French within an HPSG framework, arguing in part that the syntactic properties of the data are unable to be accounted for without the inclusion of sentential constructions in the grammar. In a response to Culicover & Jackendoff’s (1999) challenge that comparative correlatives are *sui generis*, den Dikken (2005) proposes that crosslinguistically, there exists a structural correlative frame from which the learner can reliably and successfully hypothesize comparative correlatives. This frame is sufficient to derive both the syntactic properties and semantic interpretation of comparative correlatives. As for semantic analyses, Beck (1997) examines comparative correlatives (still using McCawley’s term “comparative conditional”) in German, and proposes a compositional semantics for the expression type. She suggests that this proposal can be extended to English and Mandarin Chinese. Picking up the semantic details where Beck (1997) left off, Lin (2007) proposes a semantic structure for comparative correlatives in Mandarin Chinese. The proposals of den Dikken (2005), Beck (1997), and Lin (2007) are compositional in nature.

Within each of the frameworks from which these analyses are proposed lies a body of theoretical assumptions. We will see that one theoretical assumption plays a key role in developing analyses of comparative correlatives: the use of sentential

constructions. In all but one of the syntactic analyses reviewed in this chapter, constructions are not just used in the proposal, they play a vital role in the broader theoretical framework. The exception to this is den Dikken (2005) who expressly sets as the goal of his analysis to defend against the notion that comparative correlatives serve as a challenge to a Principles and Parameters (P&P), UG-based theory of grammar, entailing that constructions are not needed to derive comparative correlatives or for the child to learn them. My perspective on this is that I find it is not coincidental that most proposed analyses of comparative correlatives rely upon sentential constructions in order to explain their behavior. Independent of whether a specific analysis of comparative correlatives is viable, the theoretical reliance upon sentential constructions is noted to be an important theoretical primitive within some frameworks. If an analysis is proposed within a framework that values eliminating such primitives, the work required to do so is not to be underestimated. This is especially true for data that are considered to be ‘peripheral.’ Comparative correlatives presumably earned the label ‘peripheral’ because the data do not lend themselves to a readily apparent syntactic analysis. Further, formal semantic analyses require the use of apparatus that is not readily found in garden-variety declarative propositions. This chapter serves to examine this reliance upon sentential and phrasal constructions in order to set up the analysis given in the next chapter, where these constructions are assumed not to exist.

We walk through the literature on comparative correlatives with a goal of gathering the empirical data and summarizing the development of analyses. But perhaps just as important is to be aware of what the fundamental assumptions of each theoretical

framework are, and what the consequences for these specific data are if one or more of those assumptions is revealed to be in error.

The chapter is organized in the following way: §2 introduces the data and the early theoretical proposals for its treatment in construction grammar (Fillmore 1987, McCawley 1988, 1998); §3 reviews the analysis of the data in what I term the Jackendovian framework, where syntactic structure and semantic structure are two separate entities. This section will include significant discussion of empirical data presented in Culicover & Jackendoff (1999, 2005) and of additional data introduced here. §4 looks at an analysis of comparative correlatives from an HPSG perspective by reviewing a series of papers by Borsley and his colleagues (Borsley 2003, 2004; Abeillé, Borsley & Espinal 2006). This analysis looks closely at the data in four different languages – Polish, English, French and Spanish. §5 is a review of a compositional syntactic analysis of the data assuming the framework of P&P and UG. By looking at comparative correlatives across languages and language families, den Dikken (2005) proposes that the data can be accounted for by looking at similar data like correlatives and free relatives. In §6, we look at two proposals for the formal semantics of the data. Beck (1997) considers primarily German data, and Lin (2007) considers comparative correlatives in Mandarin Chinese. In §7, the data presented in this chapter which is directly relevant for the following proposal in chapter III is summarized. §8 concludes. Within each section, I present the contents of the paper, then any comments or critiques I have regarding the paper, and then summarize the data from the paper that are centrally important for my own proposal in Chapter III.

Let us start from the beginning then.

2. Construction grammar proposals

2.1 Fillmore (1987)

2.1.1 Summary of the paper

Fillmore (1987) introduces comparative correlatives within the context of conditional sentences. He says that there exists a collection of types of sentences that share a common sentence-level syntactic structure. Most noticeably, all the types of conditional sentences consist of two clauses and the two clauses appear to have the same structural relationship to each another. In addition to this observation, there are many additional commonalities between these types of sentences with respect to tense, mood, negative polarity items (NPIs), antecedent and coreferential relationships, the possibility of counterfactuals, and the general semantics of each type of sentence. The proposal Fillmore makes is that a sentential construction, the conditional construction, is responsible for the commonalities among these various sentence types. Without the assumption that such a construction exists, or more importantly that any sentential construction exists, Fillmore argues that one cannot arrive at a theoretical explanation for the data; rather, one would be left at merely describing the data. The data that are central to the argumentation are comparative correlatives. The assertion is that the broad collection of syntactic and semantic behaviors observed in comparative correlatives cannot be explained unless there is a sentential construction that includes information central to the theory predicting these behaviors. Put another way, the various sentence types that comparative correlatives share syntactic and semantics traits with is too broad for a compositionally-based theory to adequately explain.

Comparative correlatives consist of two clauses, both identical in structure. Each clause contains two segments, “X” and “Y.” “X” has two parts, the word *the* and the “comparative expression,” defined as the comparative marker and the constituent it modifies. The comparative expression can be of any syntactic category. The “Y” segment is a clause with a gap that can house an expression of the syntactic type as that found in the comparative expression. The relationship between the “X” segment and the “Y” segment is one of long distance dependency, as evidenced by the ambiguity of a comparative correlative clause like (1). *Carefully* can be construed as modifying either the embedded verb *behave* or the higher verb *assume*.

(1) The more carefully you assume he’s going to behave...

The author reports that in his own dialect the first clause of a comparative correlative can house the word *that* between the “X” and “Y” segments whereas the second clause cannot, as seen in (2).⁶ The first clause appears to be a negative polarity context (3), and the second clause permits Subject-Auxiliary Inversion (SAI) (4).

(2) The more (that) you think about the problem, the easier (*that) it will be to solve.

(3) The more you do **any** of this, the easier it gets.

(4) The older she got, the less likely **was she** to agree with me on this question.

Moving to the semantic interpretation of comparative correlatives, Fillmore describes the expression in this way. The first and second clauses establish either two scales or two ranges on one scale. The meaning of the expression “asserts a correlation or

⁶ In a later subsection of this chapter (§3.2.3) we will see the results of a study showing that Fillmore’s characterization of his own dialect appears to be widespread among English speakers. Culicover & Jackendoff (1999) which is reviewed in §3 of this chapter report that the second clause can, in fact, contain the word *that* in the position between Fillmore’s “X” and “Y” segments. This judgment reported by Culicover & Jackendoff (1999), based on the disclosure of the authors, appears to be reflective of the authors’ idiolects.

dependency relationship between values on these two scales” with the first clause providing an independent variable and the second clause providing the dependent variable (Fillmore, 1987: 166). Fillmore makes the connection between comparative correlatives and standard conditionals, inasmuch as the antecedent (*if*-clause) of a conditional is an independent clause imposing a condition upon the consequent (second clause), the dependent clause. Whether a comparative correlative is interpreted as a general principle (i.e., *The more he eats, the sillier he gets*), a contingent prediction (i.e., *The faster we drive, the sooner we'll get there*), or a past correlation (i.e., *The more he drank, the sillier he got*) results from the tense and modality of each clause and the interaction between the two clauses.

With this collection of the data, Fillmore writes, “It seems clear from the above that any successful description of these phenomena require us to assemble *for this single construction* an organized body of facts which cannot simply be taken for granted as following from other facts independently knowable about the grammar of English” (emph. C. J. Fillmore) (Fillmore, 1987: p.166). The “single construction” refers to the comparative correlative. There are two distinct and relevant points made in the previous quote. First, the collection of behaviors just presented cannot be explained adequately in a theory if one assumes that each behavior can be derived from an independent part of the grammar. Thus, there is the need for sentential constructions in a viable theory of language. Second, it is emphasized by the author that the need for sentential constructions is not argued for because of many types of sentences; rather, if the only odd type of sentence in the grammar were comparative correlatives, that would be enough to merit the need for sentential constructions. If the first point is true, then the second follows

trivially. Thus the real challenge to any compositional analysis of comparative correlatives is the first point – the collection of behaviors just presented cannot be adequately explained in a theory if the syntactic structure and semantic interpretation are derived solely by composition of morphemes and words.

Based on the immediately prior assertion, the underlying construction necessary for comparative correlatives to exist in language is proposed to be a kind of conditional construction and the first clause is henceforth referred to as “A” as a shorthand notation for “Antecedent” and the second “C” for “Consequent.” In standard conditionals, the pairing of the tense and mood of the verb in each clause determines how the whole sentence is understood, just as was seen for comparative correlatives. The Antecedent clause of a conditional is a negative polarity context, just as the first clause of the comparative correlative is.

Several different kinds of conditional sentences are given: integrated (5), epistemic (6), performance (7), concessive (8), and non-conditional conditionals (9) (Fillmore’s names for the types except where noted). By presenting an array of conditional sentences, the paper asserts that it is an inherent property of conditional sentences that the two clauses, Antecedent and Consequent, “combine to create a single scene.” It is misleading to reduce the meaning of conditionals to the truth value of the Antecedent, the truth value of the Consequent, and the resulting truth value of the entire conditional.

- | | | |
|-----|--|---------------------------|
| (5) | If you say that again, I'll scream | integrated |
| (6) | If the lights are out, they're not home | epistemic (Sweetser 1984) |
| (7) | If you're looking for a typist,
I can do twenty words a minute | performance or speech act |
| (8) | If you lived in Tokyo for fourteen years,
how come you don't know a word of Japanese? | concessive |
| (9) | I wouldn't eat that stuff if you paid me | non-conditional |

In fact, the truth value for one clause many times cannot be ascertained as it is the case that the clause cannot stand alone. For instance in (10), neither the Antecedent clause *anyone touched his bicycle* nor the Consequent *he would cry* can stand alone as an acceptable sentence. What the truth value of each clause should be is unclear. Thus the conclusion is that one must consider both clauses together simultaneously, that is, one must consider the conditional as a whole when one determines the semantic interpretation of a conditional.

- (10) If anyone touched his bicycle, he would cry

The general principle for conditional constructions is that this type of sentence expresses “a contingency relationship between two events or states of affairs, one being the occasion of the other” (Fillmore, 1987: 175). Fillmore is arguing not against truth theoretical semantics, but rather that the truth conditions of each clause cannot be determined due to their necessary semantic dependence upon one another. In the specific instance of the consequent, he is arguing that the truth value of this phrase, like the expression *he would cry* in the complete sentence in (11) below, cannot be calculated without information provided outside the phrase. The modality introduced by *would* is only interpretable by the proposition in the antecedent in (10) and by surrounding sentences in (11). Since in both instances we do not have this extra-propositional

information, the truth value of the clause, either the consequent in (10) or the isolated expression in (11), cannot be calculated.

(11) He would cry

Though not explicitly stated in relation to the broad array of conditional data presented, the connection for this general principle to comparative correlatives can be surmised. Neither clause of a comparative correlative can stand alone, and the semantic interpretation of these sentences must be drawn from the sentence as whole, not one clause, then the other, and then the two together. What is explicit in the conclusion is the author's proposal that the best way to explain data like this are with sentence-type constructions. Constructions "live in a language as packages of conventional knowledge, as assemblies of properties held in place by principles of mutual compatibility and incompatibility. In perhaps all cases, the assembled properties defining a single construction are never unique to this construction, but are properties available for the definition of other constructions too" (Fillmore 1987: 181).

2.1.2 Commentary

This paper sets as a goal to show that comparative correlatives are data that require sentential constructions in a model of grammar. Despite this, Fillmore does not articulate exactly how the relatively small collection of characteristics he just presented provide evidence that make comparative correlatives unlike any other expression in the English grammar. Given this lack of full explanation, we can only deduce and speculate exactly which characteristics he found unlike any other data in the language. By mere description, he notes that the sentences consist of two clauses, both starting with the word *the*, and which have a semantic interpretation of comparison between two scales. Apart

from the sentence necessarily consisting of two and only two clauses, the other two characteristics I just listed are unique to comparative correlatives. Fillmore's point can be reduced to saying that there are words in comparative correlatives (i.e., *the*) that don't appear elsewhere in the grammar, and that comparative correlatives have a semantic interpretation that also doesn't appear elsewhere in the grammar. If this is his point, I agree with him. However, Fillmore does not discuss why the uniqueness of this word in comparative correlatives must be encoded in the grammar at the level of sentential construction. His presents evidence in favor of comparative correlatives having unique characteristics distinct from all others in the language, namely that the first clause of a comparative correlative shows three behaviors (allowing optional *that*, hosting NPIs, and permitting SAI) that the second clause doesn't; this evidence could be used to argue for the necessary existence of a sentential construction for this data to exist in a language. With respect to this claim, I would not agree with Fillmore. It remains to be demonstrated that any one of these behaviors of a single expression cannot be accounted for by the combination of its individual parts.

With respect to the discussion of compositional semantics, Fillmore claims that the semantics of a single clause of a conditional cannot be computed (c.f., examples (10)-(11) and the discussion above), which is supported by an analysis of conditionals which depends upon compositionality to determine the truth value (i.e., where the truth value of the entire expression is calculated, given that the operator *if* in the relative clause takes scope over the nuclear clause). A view of conditionals which appeals to belief states or possible worlds (Kratzer, 1991) makes this problem moot. Fillmore (1987) predates this approach. In current theory, it is the case that an epistemic approach to conditionals is

largely accepted. This point used as support in favor of sentential constructions, then, is not immediately apparent.

As it relates directly to construction grammars broadly speaking, there is one point to note which is implicit in this paper. Some of the properties of one type of construction will always overlap with another type of construction. In other words, construction grammar as a system contains redundancy.

2.1.3 Important points to note

Fillmore (1987) provides a good deal of data not seen before, as this is the first paper that deals almost exclusively with the comparative correlatives. Several of Fillmore's contributions relate directly to my analysis in chapter III:

- Comparative correlatives consist of two clauses, the first subordinate to the second.
- Comparative correlatives are like conditionals syntactically.
- An optional *that* can occur only in the first clause in between the comparative and the rest of the clause, as in example (2), reproduced here as (12):

(12) The more (that) you think about the problem, the easier (*that) it will be to solve.

2.2 McCawley (1988)

2.2.1 Summary of the paper

Following Fillmore's (1987) analysis of comparative correlatives as one of many different types of conditional sentences that all require the existence of a conditional construction in the grammar, McCawley's (1988) paper defends a Fillmorean analysis for comparative correlatives in English, German, and Mandarin Chinese (p.176). Based on this crosslinguistic data, it is proposed that comparative correlatives inherit their

properties from conditionals and from comparatives. Accordingly McCawley terms the data “comparative conditionals.” McCawley defends the hypothesis that sentential constructions are ineliminable. Comparative correlatives are an example of a sentential construction that is comprised of two other sentential constructions (comparative and conditional). He writes, “a construction that is defined in terms of more basic constructions inherits all properties of the more basic constructions that do not conflict with rules that are specific to the derived construction” (p. 176). Some of the ideas and proposals in this short proceedings paper are also given in a more precise form in McCawley (1998). When applicable, I give the complete explanation of data and proposals drawing from both sources with appropriate citation.

McCawley’s paper is organized in this way: in each of the three languages, properties of the comparative correlative are identified as (i) common to the conditional construction, (ii) common to comparative constructions, or (iii) idiosyncratic to comparative correlatives. By presenting the data in this way, the proposal that comparative correlatives are a unique construction comprised of two other distinct constructions is supported. The properties common to conditionals show that a conditional construction is involved in the derivation of the sentence, the properties common to comparatives show that a comparative construction is involved in the derivation of the sentence, and the idiosyncratic properties demonstrate that the construction needed in the grammar to create a comparative correlative must exist and be distinct from all other constructions.

Considering first English comparative correlatives, these data hold two properties in common with conditionals. The first similarity of comparative correlatives to

conditionals is that the first clause, the subordinate clause, cannot host future *will*.

McCawley gives examples (13) and (14) (his (5a) & (5a')) to demonstrate this property.

- (13) The faster you (*will) drive, the sooner you'll get there
- (14) If you (*will) drive fast, you'll get there by 2:00.

The second property that comparative correlatives and conditionals hold in common is that the order of the two clauses can be reversed, such as seen in (15). In a “reversed” comparative correlative (most recently termed **Inverted Comparative Correlative**, or **ICC** (Culicover & Jackendoff, 2005))⁷ the main clause appears first linearly and the subordinate clause second. The main clause necessarily has a canonical word order, unlike in the comparative correlative. In (15)a, the comparative correlative, the main clause is *the worse the damage is*. The adjectival predicate *worse* appears at the front of the clause, preceded by the word *the*. In (15)b, the inverted comparative correlative, the main clause is *the damage is worse*. The word order does not appear to have undergone any change and *the* is not present. The proposal is that this property of the comparative correlative to permit the order of the two clauses to be reversed is like the same possible reversal of the two clauses of conditionals (16).

- (15) a. The longer the storm lasts, the worse the damage is
b. The damage is worse, the longer the storm lasts
- (16) a. If the storm lasts long, the damage will be bad
b. The damage will be bad if the storm lasts long

McCawley notes that there are idiosyncratic properties to the ICC which accordingly must be specified in the constructions of CCs (and ICCs). When the clauses are reversed, the main clause must drop the word *the* and the compared expression must

⁷ This type of data, like standard comparative correlatives, has gone by a range of labels. Again, in order to reduce confusion in reference throughout this thesis, I will use the term Inverted Comparative Correlative (ICC) consistently henceforth.

not be preposed. The main clause of the comparative correlative in (17) includes the clause-initial *the*, and the compared expression *worse* is preposed. In the corresponding ICC in (18), the main clause must not include the word *the*, and preposing of the compared phrase is not permitted, and certainly not required.

- (17) The longer the storm lasts, the worse the damage will be CC
 (18) The damage will be worse, the longer the storm lasts ICC

English comparative correlatives hold properties that are common to comparatives as well. They use the full range of comparative morphology such as *-er*, *more*, *less*, and suppletive forms (e.g., *worse*, *better*). This contrasts with data that include comparison but not the full range of comparative morphology as in (19)a-c. Given this use of the full range of morphology, the comparative correlative construction includes an actual comparative construction.

- (19) a. Roger is more happy than surprised
 b. *Roger is happier than surprised
 c. *Roger is happier than more surprised

English comparative correlatives also demonstrate unbounded dependency between the compared phrase and its gap site (20), much like regular comparatives do

(21) (as per Chomsky, 1977).

- (20) The kinder₁ [he thinks [you're going to be ___₁ to him]], the more trouble₂ [you can anticipate [that he'll feel like [giving you ___₂]]].
 (21) John is smarter than [WH-OP₁ [he told Sue [that he thinks [that Bill is ___₁]]]]

There are three unique characteristics of the comparative correlatives in English. First, 'notational' comparatives are permitted in ICCs (and not in comparative correlatives). In comparative correlatives, the overt presence of a comparative is necessary in both clauses (22). In the ICC however, the expression is licit if the semantics are comparative even if the comparative morphology is not expressed in the main clause

(23). The comparative morphology always must be present in the subordinate clause of the ICC (24).

(22) *The more attention he gets, his happiness increases

(23) His happiness increases the more attention he gets

(24) *He gets happier, the attention he gets increases

Second, only the ICC (and not the comparative correlative) can be negated. McCawley's (1987) example (13) ((25) below) is presented as evidence that in the ICC version of comparative correlatives negation is possible, but not in 'standard' comparative correlatives.

(25)	a. John doesn't get angrier the longer he waits	ICC
	b. *The longer John waits, the angrier he doesn't get	CC

Third, comparative correlatives allow omission of main copular verbs under certain circumstances. In a standard comparative correlative (26), the matrix verb of each clause can be deleted if it is copular. This is restricted by the verb being the final spoken element in a clause (27), and consequently is not possible in conditionals (28). Further, deletion of a copular verb is not permitted in other expressions in which a constituent has presumably moved to a higher COMP position and left a silent gap after the now sentence-final copular verb (29). More specifically addressing the limitation on this optional deletion in comparative correlatives, the generalization is made that copula deletion in a clause of a comparative correlative is only licit when the subject of the clause is generic, rather than specific. The data which follow from this generalization are seen in (30) and (31). This generalization is iterated in McCawley (1998).

- (26) The more outrageous a politician's promises (are), the bigger his vote count (is)
- (27) A politician's vote count is/* \emptyset bigger, the more outrageous his promises (are)
- (28) If a politician's promises are/* \emptyset outrageous, his vote count is/* \emptyset big
- (29) John wonders how concerned about justice lawyers are/* \emptyset
- (30) The more obnoxious Fred is/* \emptyset , the less attention you should pay to him
- (31) The more obnoxious a child is/ \emptyset , the less attention you should pay to him

Moving on to McCawley's characterization of comparative correlatives in German and Mandarin Chinese, German comparative correlatives are characterized by the two morphemes *je* and *desto* (or *umso*), appearing in the first and second clause respectively (32). McCawley (1988) says that these are markers that replace the *the* that obligatorily begins both clauses in English.⁸ German allows the two clauses to be reversed (ICC) (33), just as English comparative correlatives did, and similar to English conditionals as well. Differently from English though, the German ICC allows the overt presence of *desto* in the main clause, whereas English ICCs were unacceptable if *the* appeared in the main clause. In this way, German comparative correlatives are like conditional constructions in that they allow the two clauses to reverse order, but there must also be a unique construction for the comparative correlative and the ICC to deal with the idiosyncratic behavior of *je* and *desto/umso*.

- (32) *je länger du in Deutschland wohnst, desto besser wirst du Deutsch sprechen*
the longer you in Germany live the better will you German speak
 "The longer you live in Germany, the better you will speak German."
- (33) *Der Bankier benahm sich desto lustiger, in je gefährlicher Laune er sich befand*
the banker behaved more the happier in the dangerous mood he was in
 "The banker behaved more happily, the more dangerous a mood he was in."

⁸ Roehrs, Sprouse & Wermter (2002) present data in German that leads to the conclusion that *je* and *desto/umso* in German comparative correlatives are not simply instances of exactly the same item as *the* in English comparative correlatives, and further that the lexical items *desto* and *umso* differ from one another syntactically. Given what is presented by Lin (2007) for Chinese (reviewed later in this chapter) and what I present for English (in chapter III), I take the argumentation and conclusion of Roehrs, Sprouse, and Wermter (2002) to be correct.

It can immediately be surmised that the first clause of the comparative correlative is subordinate because the finite verb (*wohnst*) is clause-final, a characteristic of word order in subordinate clauses in V2 languages. This also predicts that the finite verb in the main clause (*wirst*) should be in second position. However, relative to the finite verb in the main clause, the subordinate clause is in first position, the *desto* phrase (*desto besser*) is in second, followed by the finite verb of the main clause in third position. McCawley explains this deviation as another unique characteristic of the German comparative correlative that must be informed by a unique construction for this type of expression. In this way, construction-specific properties override general rules in a language that otherwise apply across the board.

Given this data, McCawley concludes that German requires a unique construction for comparative correlatives, and that this construction contains a conditional construction.

Mandarin Chinese comparative correlatives show characteristics of conditionals and of comparatives. They are similar to conditionals in that both kinds of sentence can include the morpheme *jiù* (“then”), considered to be a conditional marker ((34) and (35), McCawley’s (22)a & (22)b, taken from Chao (1947:167). McCawley also notes that the comparative correlative is marked with *yùe*, which is glossed “CC” in (34) to reflect this status.

(34) Nǐ yuè dǎ tā de chà, tā **jiù** yuè shuō- bu- ting CC
you CC inter- he GEN rupt he then CC speak-not- stop
 ‘the more you interrupt him, the more he can’t stop talking’

(35) Nǐ yàoshi dèshēng shuōhuà, wó **jiù** bu tīng Cond.
you if big-voice speak I then not listen
 ‘If you talk loud, then I don’t listen.’

Mandarin comparative correlatives are like conditionals in that same language in two ways. By examining the distribution of the marker *yùè*, McCawley determines that *yùè* is akin to the comparative marker, such as the instance of *bǐ* (“than”) in (36) (McCawley’s (25a)). A second way in which comparative correlatives and comparatives in Mandarin are similar is that the possible categories of constituents that can be modified by the comparative are the same restricted set in both kinds of sentences. This contrasts with English, which allows comparative modification of a broad array of lexical categories (e.g., noun, adjective, adverb, verb, TP, and PP). Presumably Mandarin comparative correlatives hold these properties because they inherit them from the comparative construction that is a part of the comparative correlative construction.

- (36) Zhāngsān [bǐ Lǐsì] gēo
*Zhangsan **than** Lisi tall*
 ‘Zhangsan is taller than Lisi.’

There is a unique characteristic of Mandarin comparative correlatives that justifies the proposal of its own unique construction. In Chinese, there is evidence of long distance dependencies in comparative correlatives just as was seen in English ((20)-(21)). However, unlike comparative correlatives in Mandarin and both comparatives and comparative correlatives in English, in Mandarin comparatives, these long distance dependencies are somewhat difficult to construct. Since the comparative correlative could not have inherited this property from the comparative construction, it must be specified in the comparative correlative construction in Mandarin.

The conclusion of this cross-linguistic data is that sentential constructions are essential to a grammar, and that comparative correlatives are an example of an expression utilizing a sentential construction which necessarily contains other sentential

constructions, comparatives and conditionals in this case. Though space does not permit in the (1988) paper for a demonstration, McCawley also concludes there that a model of grammar lacking sentential constructions is not tenable.

2.2.2 Commentary

There are three distinct data points that McCawley presents in this paper that I will address in this section. The first is his proposed generalization that the first clause of a conditional or a comparative correlative cannot host future *will*. The judgments of examples (13) and (14) (repeated here as (37)-(38)) are not questionable; the inclusion of the future *will* in the first clause of this comparative correlative and in the first clause of this comparative results in unacceptable sentences, and this is in sharp contrast with the resulting acceptable sentences that arise when *will* is omitted.

- (37) The faster you (*will) drive, the sooner you'll get there
- (38) If you (*will) drive fast, you'll get there by 2:00.

Despite this, there are data that do not demonstrate this contrast. First, let's consider the premise about conditionals that future *will* is suppressed in the *if*-clause (the subordinate and canonically first linear clause). In (39)-(41) that follow, we can see that the overt presence of *will* in the *if*-clause does not result in unacceptability. We conclude from this that whatever is the source of unacceptability in (13) and (14) cannot simply be the presence of the auxiliary verb *will*.

- (39) If you'll be at the mall tomorrow, you'll see the items on sale
- (40) If Mark'll/will turn in his homework on time during the next two weeks, he'll/will be able to pull his grade up to a B.
- (41) If I will promise you that tomorrow will be different, will you in turn promise me that you will reconsider the situation?

Two points can be made about future *will* in the *if*-clause of a conditional. First, a future tense semantic interpretation is available in the *if*-clause without the presence of

overt *will*, as in (42)-(44). Secondly, if future *will* is in the *if*-clause, it must also appear in the main clause (45)-(47). I do not give a judgment notation (e.g., * or ✓ or #) for (45)-(47) because it is unclear to me whether this unacceptability is due to a problem with the syntax or that it is semantically incomprehensible. Regardless, those sentences are not acceptable and the source of that unacceptability appears to be the absence of future *will* in the main clause.

- (42) If you are at the mall tomorrow, you'll see the items on sale
- (43) If Mark turns in his homework on time during the next two weeks, he will be able to pull his grade up to a B.
- (44) If I promise you that tomorrow will be different, will you in turn promise me that you will reconsider the situation?

- (45) If you'll be at the mall tomorrow, you see the items on sale
- (46) If Mark'll/will turn in his homework on time during the next two weeks, he's/is able to pull his grade up to a B.
- (47) If I will promise you that tomorrow will be different, do you in turn promise me that you will reconsider the situation?

Based on this new data, we must conclude that the generalization that future *will* is obligatorily suppressed in the *if*-clause of a conditional is not accurate. Aside from noting this for reasons of posterity, there is a more immediate reason for addressing this point. Though the subordinate clause (the *if*-clause) of a conditional can host future *will*, the subordinate clause of a comparative correlative CANNOT host future *will*, as seen in (48)-(50). Thus this is a property of comparative correlatives that appears to be unique to this kind of construction (in McCawley's terms), not a property that it holds in common with conditionals.

- (48) The more you (*will) exercise, the better you will feel
- (49) a. The less Mark argues, the more likely he will be to get along with his colleagues.
 b. *The less Mark will argue, the more likely he will be to get along with his colleagues.
- (50) a. *The longer the storm will last, the worse the damage will be
 b. The longer the storm lasts, the worse the damage will be

A second data point that McCawley (1988) makes is that only the ICC (and not the comparative correlative) can be negated as in (25), repeated below as (51).

- | | | |
|------|---|-----|
| (51) | a. John doesn't get angrier the longer he waits | ICC |
| | b. *The longer John waits, the angrier he doesn't get | CC |

However, when we change the main clause as in (52) and (53), it is clear that negation of the matrix verb in the main clause is possible. This still leaves us to determine what the source of the unacceptability of (25)b is (c.f., (51)b here), but I leave that problem for now.⁹

- | | | |
|------|--|-----|
| (52) | a. John doesn't want to be reasonable the longer he waits | ICC |
| | b. The longer John waits, the more he doesn't want to be reasonable | CC |
| (53) | a. John isn't willing to be reasonable the longer he waits | ICC |
| | b. The longer John waits, the more he isn't willing to be reasonable | CC |

The third data point I will address is one that McCawley (1988) states as generalization, namely that copula deletion in a clause of a comparative correlative is only licit when the subject of the clause is generic, rather than specific. The relevant data are repeated here as (54)-(59).

⁹ The unacceptability of (25)b is likely related to the now well-known observation that degree questions cannot be formed by *wh*-movement over negation, such as *how angry didn't he get?* (c.f., Obenauer, 1984; Rizzi, 1990) Given this, the unacceptability of (25) may be because the semantic interpretation is infelicitous rather than due to a syntactic violation.

- (54) The more outrageous a politician's promises (are), the bigger his vote count (is)
- (55) A politician's vote count is/* \emptyset bigger, the more outrageous his promises (are)
- (56) If a politicians' promises are/* \emptyset outrageous, his vote count is/* \emptyset big
- (57) John wonders how concerned about justice lawyers are/* \emptyset
- (58) The more obnoxious Fred is/* \emptyset , the less attention you should pay to him
- (59) The more obnoxious a child is/ \emptyset , the less attention you should pay to him

The characterization of the data in (54)-(57) nails down much of the observable characteristics of licit copula deletion in comparative correlatives. The last part of the generalization however, that the conditions under which deletion is licit are determined by the semantic interpretation of the sentence, must be revised in light of additional data in (60)-(65). The importance of addressing this portion is because if the generalization above were correct, it would have important theoretical ramifications. If deletion is a syntactic operation and one that must occur without access to the semantic interpretation if a "Y"-type model of syntax is assumed. To determine that deletion must have access to the semantic interpretation would stand as evidence against a "Y"-type model. As it turns out, deletion of a copular verb is not contingent upon a generically interpreted subject.¹⁰ Taken with (58) and (59), (60) shows that when the subject is phonologically heavy (*Fred's younger brother* vs. *Fred* in (59)), the copula deletion is permitted despite the subject's specific semantic interpretation.

- (60) The more obnoxious Fred's younger brother, the less attention you should pay to him

There are two characteristics of comparative correlatives that appear to play a role in whether or not copula deletion is licit. Based on what we've just seen in (58)-(60), the

¹⁰ The conclusions drawn here, contra-McCawley's (1988, 1998) copula deletion generalization, were developed during the research of and were prompted by and supported by the findings of Resnik, Elkiss, Lau, & Taylor (2005). Most significantly, using the World Wide Web as a corpus, a query of 3.5 million sentences yielded the result that **all** instances of copula deletion included deletion of a main copular verb **in both clauses**. The subject of these clauses was often generic, but not in all cases.

phonological weight of the subject is a factor in copula deletion in that phonologically heavy subjects permit this operation more readily than do phonologically light subjects. Hence optional copula deletion in English comparative correlatives is not permitted with pronominal subjects (61)-(65).

- (61) The worse Bill's behavior (is), the more trouble he (*is)
- (62) The worse the children's behavior (is), the more trouble they (*are)
- (63) The worse my behavior (is), the more trouble I (*am)
- (64) The worse our behavior (is), the more trouble we (*are)
- (65) The worse your behavior (is), the more trouble you (*are)

Further, there appears to be some kind of parallelism preference between the two clauses.

Following up on the findings of Resnik, Elkiss, Lau, and Taylor (2005), acceptability judgments on the sentences in (66)-(68) are from linguistically naïve native English speakers (i.e., non-linguists). Generally speaking, speakers accept copula deletion with perfect acceptability in the case where both clauses contain a main copular verb and both copulas are deleted ((68)c). This contrasts with (68)a and (68)b where both clauses contain a copula verb and only one is deleted, which are judged as less acceptable. In (66) and (67) we see that if copula deletion occurs in only one of the clauses, speakers judge it to be more questionable when the main verb of only one of the clauses is copular (the (a) sentences in (66) and (67)) than when both clauses contain a copular verb (the (b) sentences in (66) and (67)). Speakers did not judge any sentence perfectly acceptable in which copula deletion had occurred in only one of the clauses.

- (66) a. ?? The longer the day's activities last, the sleepier the campers ~~are~~
- b. ? The longer the day's activities are, the sleepier the campers ~~are~~
- (67) a. ?? The more tiring the day's activities ~~are~~, the more food the campers eat
- b. ? The more tiring the day's activities ~~are~~, the sleepier the campers are
- (68) a. ? The longer the day's activities are, the sleepier the campers ~~are~~
- b. ? The more tiring the day's activities ~~are~~, the sleepier the campers are
- c. ✓ The more tiring the day's activities ~~are~~, the sleepier the campers ~~are~~

Moving to his discussion of Mandarin comparative correlative, McCawley analyzes the morpheme *yuè* in a way that Lin (2007) (reviewed in this chapter in §6.2) refutes. McCawley (1988) treats *yuè* as a marker of comparative correlatives, as reflected in his gloss of the morpheme as “CC,” short for “Comparative Conditional.” For McCawley, *yuè* is akin to the comparative marker, such as the instance of *bǐ* (“than”). Lin (2007) reanalyzes this morpheme as a degree adverb.

I will make one last comment here, not so much about about McCawley’s (1988, 1998) proposal, but more relevant to my own proposal. McCawley takes ICCs as evidence that comparative correlatives are like conditionals and that the *if*-clause-like first clause can move freely in first or second position linearly. It is a small step from this idea to assume that comparative correlatives and inverted comparative correlatives are derivationally related. I do not make this assumption. While it is true that the two types of expressions have virtually synonymous semantic interpretation and that, apart from the position of the subordinate clause, their syntax appears to vary by only one word (*the*), I assume that the derivational similarity between the two stops there. In this way, they are similar to other, more familiar data, *tough*-constructions, shown in (69)-(70).

- (69) It is tough to talk to Jon
(70) Jon₁ is tough to talk to ___₁

Whatever we take to be the analysis of *tough*-constructions, it is not assumed that expressions like (69) and (70) are derivationally related.

2.2.3 Important points to note

Like Fillmore (1987) asserted for comparative correlatives using data from English, McCawley asserts that comparative correlatives must consist of two and only two clauses. He bolsters Fillmore’s claim by adding data from two more languages,

German and Mandarin. In addition to this contribution, there are three data points that McCawley adds to the literature that will become directly relevant to my analysis of the data.

- German comparative correlatives are marked by the presence of *je*, *desto* and *umso* and says they are the markers of comparative correlatives in that language, much as *the* is a marker of comparative correlatives in English.
- The first clause of a German comparative correlative is subordinate to the second as deduced from the word order expected, given that German is a V2 language.
- Mandarin comparative correlatives include a morpheme found in conditionals, *jiù*, that roughly translates as *then*.

3. Distinct Syntactic & Semantic Structures: Culicover & Jackendoff (1999, 2005)

3.1 Summary of the paper

In a framework uniquely different from the others that comparative correlatives have been analyzed within, Culicover & Jackendoff (1999, 2005:ch.14) argue that these data are best explained, along with a host of other types of data, by assuming first that syntactic information and semantic information are not determined by a single structure. In other writings prior to this 1999 paper and 2005 chapter (Culicover & Jackendoff 1995, 1997), and much more exhaustively in Jackendoff's (2002) book, the details of the proposal for the theoretical framework are given. For the purposes of accurately describing the treatment put forth for comparative correlatives, I will provide some of the relevant assumptions of that framework proposal within this summary of the paper. In an attempt to reduce confusion, I will henceforth refer to this theoretical framework that does not assume centrality of the syntax as the Jackendovian framework.

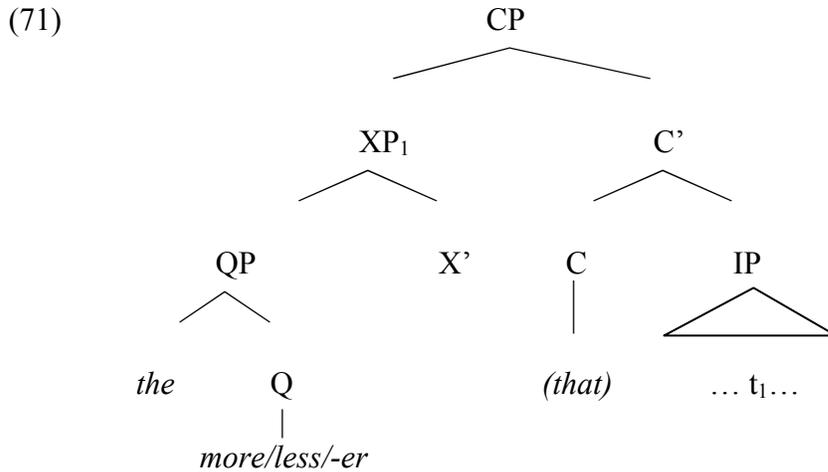
Within the Jackendovian framework, any sentence is able to be analyzed (at least) as a syntactic structure and as a conceptual structure. Syntactic structure corresponds to a sentence's behavior with respect to lexical items and some syntactic constraints; conceptual structure deals with a sentence's semantic interpretation. The broader idea that this framework espouses is that a sentence's apparent syntactic structure often times does not match up with its semantic interpretation. Simply put, the syntax and semantics of a sentence should be represented in separate and distinct structures.

The status of sentential constructions within the Jackendovian framework is not directly addressed in the current paper reviewed here, but in other writings (e.g., Goldberg & Jackendoff, 2004) it is made clear that the framework is compatible with and encourages the theoretical proposal of sentential constructions. As such, the proposal for comparative correlatives put forth in the Jackendovian framework (Culicover & Jackendoff, 1999) could be conceived of as a possible extension of the proposals within the framework of Construction Grammar seen in the previous section.

3.1.1 Microstructure

Before launching into the larger macrostructure that is proposed, let us look first at the microstructure of each of the clauses. The authors take the two clauses to be identical in their internal structure. As both McCawley (1988) and Fillmore (1987) correctly observe, each clause of a comparative correlative in English begins with the word *the* followed immediately by a comparative morpheme and a constituent it modifies. After this cluster of words, the rest of the clause follows and includes a gap where the comparative and its modified constituent are logically understood. Culicover

and Jackendoff (1999) propose details of this clause-initial word string in the following syntactic structure (71).



The comparative is a quantifier and the word *the* is a determiner of that quantifier (following Bresnan 1973), sitting in Spec,QP. This QP is in the specifier of an XP, which in turn is in Spec,CP. The XP is coindexed with a trace in IP, where this constituent is logically understood. I note a few important aspects of this structure. The complementizer C that is realized as the word *that* is included to account for Fillmore’s observation that the word *that* can optionally appear between the constituent that the comparative modifies and the rest of the clause (shown in (2), reproduced here as (72)). Differently from Fillmore, Culicover & Jackendoff (1999) judge the presence of *that* in this position in the second clause as acceptable (e.g., the presence of the word *that* following *the easier* in (72) would be judged as acceptable). As a result, the syntactic category of each clause is CP.

(72) The more (that) you think about the problem, the easier (*that) it will be to solve.

Looking inside the CP, the specifier of the phrase is filled with an uncategorized phrase, XP. This XP has moved from within (or alternatively, is coindexed and coreferential with a gap inside of) the IP at the bottom right of the structure. Within this

phrase is a QP, building on the proposal by Bresnan (1973) that comparatives are quantifiers. The specifier of this quantifier is what appears to be the definite determiner *the*.

Now that the internal structure of each clause is determined, we'll turn to Culicover & Jackendoff's argumentation for the macrostructure of comparative correlatives.

3.1.2 Macrostructure

Culicover & Jackendoff consider five logically possible syntactic structures for comparative correlatives that are derived from the relationship between the expression's two clauses. They eliminate all possibilities but two – a main clause with a lefthand subordinate clause, and two paratactic clauses. The first hypothetical structure is supported by tag questions and subjunctive mood data (Culicover & Jackendoff's examples (11)-(12), repeated as (73)-(74) here). Tag questions agree with the second clause, not the first. If the comparative correlative is embedded under a predicate that triggers subjunctive mood in the embedded sentence, the verb in the second clause shows this mood, not in the first.

- (73) a. ✓ The more we eat, the angrier you get, don't you?
 b. * The more we eat, the angrier you get, don't we?
- (74) It is imperative that/I demand that...
- a. ✓ ...the more John eats, the more he pay(s).
 b. * ...the more John eat, the more he pay(s).

Additional data that Culicover & Jackendoff present further provide evidence that the first clause is subordinate and the second is the main clause. In *how much*-questions (e.g., *the harder it rains, how much faster does the water flow in the river?*), the *wh*-phrase *how much* occurs in the second clause. When imperative mood is triggered in a

comparative correlative, deletion of the subject occurs in the second clause, not the first (e.g., *the more John eats, the tighter ~~you~~ keep your mouth shut about it*).

Despite this data, Culicover & Jackendoff argue that the two clauses are in a paratactic relationship to one another. The two CP clauses conjoined have a label “CC,” short for “Comparative Correlative.” This labeling choice is made because if the entire comparative correlative is of the syntactic category CP, this would constitute CP recursion, a configuration that the authors say is problematic. This entails that a comparative correlative is exocentric under this proposal. The evidence in favor of the paratactic relationship between the two clauses rests in the contrast between standard conditionals identified by the overt presence of *if* (75), and peripheral data like intonational conditionals (76) and left-subordinating “and” conditionals (77). Whereas there is evidence to demonstrate that the *if*-clause of a standard conditional is both syntactically and semantically subordinate, there is no evidence that the *if*-clause of intonational and left-subordinating “and” conditionals is syntactically subordinate. Culicover & Jackendoff reiterate the findings of Fillmore (1987) and McCawley (1988) by showing that comparative correlatives and ICCs do not permit reordering of the subordinate clause. The same is true of intonational conditionals and left-subordinating “and” conditionals. This contrasts sharply with what is typically observed for syntactically non-complement subordinate clauses: the order of main and subordinate clause is not fixed, as seen in (78)-(82).

- (75) If Mary listens to the Grateful Dead, she gets depressed
- (76) Mary listens to the Grateful Dead↑ she gets depressed↓
- (77) Mary listens to the Grateful Dead and she gets depressed
- (78) a. While Mary listens to the Grateful Dead she gets depressed
b. Mary gets depressed while she listens to the Grateful Dead
- (79) a. After Mary listens to the Grateful Dead she gets depressed
b. Mary gets depressed after she listens to the Grateful Dead
- (80) a. Before Mary listens to the Grateful Dead she gets depressed
b. Mary gets depressed before she listens to the Grateful Dead
- (81) a. Whether or not Mary listens to the Grateful Dead, she gets depressed
b. Mary gets depressed whether or not she listens to the Grateful Dead
- (82) a. Because Mary listens to the Grateful Dead she gets depressed
b. Mary gets depressed because she listens to the Grateful Dead

The authors are clear that none of the following are evidence for syntactic subordination in these data¹¹: tag questions, subjunctive or indicative mood, or *how much* question formation. Culicover & Jackendoff also are clear in claiming that binding relations/anaphora are not a reliable test in determining syntactic subordination. They support this assertion by using tests of Condition C, logophoricity, and variable binding.

Thus far, then, the only characteristic of a syntactically subordinating clause that has been shown is that it can appear before or after the main clause.¹²

There is a last set of comparative correlative data that Culicover & Jackendoff present and explain using the distinction between syntactic and semantic structures. It

¹¹ Culicover & Jackendoff (1999:553) note that this conclusion may imply that this collection of behaviors may never be used as a test for main clause status, regardless of the sentence type. For instance, for the sentence *John likes Mary, doesn't he?*, one could conclude that the tag question says nothing about whether *John likes* constitutes the subject and verb of the main clause. The authors put the question aside as it is not relevant to the central line of investigation of the paper.

¹² Culicover & Jackendoff (1999:552-3) mention that exception must be taken for standard conditionals that include *if* and *then*. The clause order must be fixed with the subordinate clause first if *then* is present in the sentence.

concerns long distance relationships between constituents outside of the two clauses and gaps within those clauses (a.k.a. successive cyclic A'-movement). As first proposed by Huang (1982), an adjunct is an island to movement. In other words, no long distance dependency between a constituent outside of an adjunct and a gap within that adjunct can exist. The generalization is derived from the Condition on Extraction Domains, or the CED. This generalization is supported cross-linguistically by a wide range of adjunct clauses that are opaque to long distance relationships, such as relative clauses, temporal clauses introduced by *after*, *before*, *while*, *during*, or *when*, sentence-final *if*-clauses in conditionals, and manner and reason clauses often characterized by the *wh*-words *how* or *why*, or the preposition *because*. A characteristically typical example which demonstrates the effects of a long distance relationship between a phrase outside of an adjunct and a gap within it can be seen in (83). The adverbial clause introduced by *because* appearing in sentence-final position contains a gap where the object of the verb *saw* should appear. It is intended that the logically understood object of this verb is the *wh*-phrase *who* which is outside of the clause at the start of the expression. The expression is unacceptable, and this is presumably a result due to of a violation of the CED.

(83) * Who₁ will Michelle go home because Rich saw ___₁ ?

If the CED is taken to be a reliable and necessary inclusion in an accurate model of human grammar¹³ (which the data we have seen thus far suggest), and if the CED is assumed to be a constraint on syntactic structure (which is taken to be the case by both

¹³ In the analysis that will be presented in chapter III, it is not assumed that the CED as proposed by Huang (1982) is a necessary and reliable inclusion in an accurate model of human grammar. In fact, it is shown to undergenerate several different kinds of data. Despite this, I go through the exercise here to show that even if we assume the CED is part of the theory and something that needs to be re-formulated the way Culicover & Jackendoff (1999) do, the result does not have empirical coverage.

Culicover & Jackendoff and by those that they argue against), then this can be used to test the status of the first clause of a comparative correlative as an adjunct clause. If the first clause is an adjunct in syntactic structure, then the presence of a long distance relationship between a constituent outside of the clause and a gap within it will necessarily create a CED violation and result in an unacceptable expression. Conversely, if such a long distance relationship does not result in an unacceptable expression, we would be forced to conclude that the first clause is NOT an adjunct clause, despite the large body of data that suggest that this indeed is the case (e.g., tag questions, subjunctive and imperative mood on second clause, subject-aux inversion, V2 effects in German). Examples (84)-(86) are Culicover & Jackendoff's examples which utilize this test of syntactic subordination (their examples (68)-(70)). They demonstrate that movement out of each of the two clauses is acceptable. (84) is the base sentence, the examples in (85) show movement out of each clause in order to form a relative clause, those in (86) show movement for topicalization.

- (84) The sooner you solve this problem, the more easily you'll satisfy the folks up at corporate headquarters.
- (85) a. ✓ This is the sort of problem which₁ the sooner you solve __₁, the more easily you'll satisfy the folks up at corporate headquarters.
 b. ✓ The folks up at corporate headquarters are the sort of people who₁ the sooner you solve this problem, the more easily you'll satisfy __₁.
- (86) a. ✓ This problem₁, the sooner you solve __₁, the more easily you'll satisfy the folks up at corporate headquarters.
 b. ✓ The folks up at corporate headquarters₁, the sooner you solve this problem, the more easily you'll satisfy __₁ .

This data demonstrating licit long distance dependencies support Culicover & Jackendoff's proposal that the first clause of a comparative correlative is not a left-hanging adjunct clause. The only remaining possibility for the syntactic relationship

between the two clauses is that the clauses are conjoined, syntactic sisters, with no coordinator, overt or covert. The two clauses' equal status with respect to movement is evidence that neither is superior to the other in the structural hierarchy. Data we saw earlier that appeared to be evidence to the contrary is taken to be evidence of what does NOT reliably diagnose syntactic subordination or main clause status. All of the following behaviors are seen because the first clause is subordinate at conceptual structure: inability to host tag questions, inability to host subjunctive mood, illicit subject-auxiliary inversion in imperative mood, and any relevant binding relationship. In addition to the data that Culicover & Jackendoff (1999) present, we must also consider McCawley's German data and conclude that V2 effects are not indicative of an expression's syntactic structure but its conceptual structure. The reliable characteristics of a subordinated clause in syntactic structure are two: a subordinate clause can appear before or after a main clause linearly, and a gap within a subordinate clause may not be in a relationship with a constituent outside of that clause (i.e., it is subject to the CED).

Under traditional assumptions, one would be tempted to claim that there is a problem with the proposal that the syntactic structure of a comparative correlative consists of two coordinated clauses. A coordinated structure is subject to the Coordinate Structure Constraint (CSC), meaning that no movement of any kind can take place from within one of the coordinate phrases to outside the coordinate structure (Ross, 1967). If we take the syntactic structure of comparative correlatives to be a coordinate structure, we predict that the two clauses will have identical behavior with respect to successive cyclic A'-movement, namely, we predict that movement out of either clause will result in an unacceptable expression. This is not overlooked by Culicover & Jackendoff. Prior to

their 1999 paper, Culicover & Jackendoff (1995, 1997)¹⁴ propose that the CSC is a constraint on conceptual (or semantic) structure, unlike the CED which is a constraint of syntactic structure. Since the conceptual structure of a comparative correlative is that of a subordinate and main clause, the CSC will not be violated and the expression will be licit.

Based on their data, Culicover & Jackendoff conclude by asserting that comparative correlatives are enigmatic data and thus classify comparative correlatives as *sui generis*, much in the same way as McCawley (1988) and Fillmore (1987) do.

Comparative correlatives do not display endocentricity, and the behavior of the two clauses points to a grammar that necessarily has separate semantic and syntactic structure.

3.2 Commentary

3.2.1 Relationship between the two clauses

Culicover & Jackendoff (1999) states that results of binding data do not indicate syntactic structure (see §3.1.2 immediately preceding). I give an elaboration of that data (donkey anaphora), reinforcing the proposal that binding relations/anaphora cannot be taken as evidence for syntactic subordination. We can see in (87)a-c that all three types of sentences have the same behavior with respect to donkey anaphora.

- (87)
- a. If [a farmer]₁ loves [a pig]₂, he₁ feeds it₂
 - b. The more [a farmer]₁ loves [a pig]₂, the more he₁ feeds it₂
 - c. Because [a farmer]₁ loves [a pig]₂, he₁ feeds it₂

Moving on to the data on A'-movement out of each clause, Culicover & Jackendoff (1999) demonstrate that A'-movement of some kinds are licit out of either clause, yet they claim that movement of a *wh*-phrase out of either of the two clauses is

¹⁴ A complete presentation of Culicover & Jackendoff's proposal in these papers with respect to the CSC and the CED is included in various portions of Jackendoff (2002).

disallowed, as evidenced by the unacceptability of their examples reproduced here in (88)a-b. However, when the comparative correlative is embedded under a higher main clause as in (89), A'-movement of a *wh*-phrase out of either clause is licit. This demonstrates that the unacceptability of (88)a-b must be due to a factor other than the movement of a *wh*-phrase. I demonstrate in chapter III that the contrast between (88) and (89) stems from illicit Subject-Auxiliary Inversion (SAI) if the main clause of the comparative correlative is the matrix clause; for now, the data stand to demonstrate that A'-movement of a *wh*-phrase out of either clause is licit.

- (88) a. * Which problem₁ does the sooner (that) you solve __₁, the more easily you'll satisfy the folks up at corporate headquarters?
 b. * Which problem₁ the sooner (that) you solve __₁, will the more easily you satisfy the folks up at corporate headquarters?
- (89) a. ✓ Which problem₁ do you think that the sooner Bill solves __₁, the more easily he'll satisfy the folks up at corporate headquarters
 b. ? Who₁ do you think that the sooner that Bill solves this problem, the more easily he'll satisfy __₁ ?

In Culicover & Jackendoff's original data demonstrating long distance dependencies, the constituent modified by the comparative¹⁵ is a sentential AdvP, like *soon* and *easily* in (84)-(86). If we probe deeper into this, we find that long distance dependencies with a gap in (a.k.a., movement out of) either clause is only possible if this constituent is a non-argument of the lower TP. If the constituent is an argument, no movement out of a clause is possible. In contrast to (85)-(86), consider (90)-(92). (90) shows that in a dative construction, movement of the indirect object (IO) *Mary* is permitted, and (91) shows that either the direct object (DO) or the sentential AdvP

¹⁵ In all existing syntactic analyses of comparative correlatives, including Culicover & Jackendoff (1999) and the one proposed in this thesis in chapter III, the comparative and the constituent it modifies together constitute a larger constituent.

happily can be the constituent targeted for modification by the comparative at the front of clause of the comparative correlative. Yet, in (92), the IO can only move out of the clause if the sentential AdvP, a non-argument, is part of the ‘comparative constituent.’

- (90) a. ✓ John gave a big rose to Mary happily
 b. ✓ Who₁ did John give a big rose to __₁ happily?
- (91) a. ✓ The more happily John gave a rose to Mary ...
 b. ✓ The bigger rose (that) John gave to Mary happily...
- (92) a. ✓ Who₁ do you think that the more happily John gave a big rose to __₁ ...
 b. * Who₂ do you think that the bigger rose (that) John gave to __₂ happily...

This pattern is what we would expect, based on movement out of an embedded clause, like that in (96). The movement of the argument NP *which flower* over the non-argument *how happily* is judged to be a lesser violation than the same movement over an argument, as in moving over *who* in (97).¹⁶

- (93) ✓ John gave a rose to Mary very happily
 (94) ✓ Do you wonder [how happily]₁ John gave a rose to Mary t₁ ?
 (95) ✓ Do you wonder which flower₂ John gave t₂ to Mary happily?
 (96) ?? Which flower₂ do you wonder [how happily]₁ John gave t₂ to Mary t₁ ?
 (97) ** Which flower₂ do you wonder who₃ John gave t₂ to t₃ happily?

I present this data here simply to provide evidence that the A'-movement allowed in a comparative correlative behaves in the same way that it does in other kinds of ‘core’ data, leading one to question the validity of Culicover & Jackendoff’s assertion that comparative correlatives should be classified as *sui generis*.

¹⁶ Examples like (97) were presented and discussed in *Current Issues in Linguistic Theory* (Chomsky, 1964).

Another data point that is interesting to note is that A'-movement out of both clauses is also licit, as in (98). This has not been noted in the literature before to the best of my knowledge.¹⁷

- (98) [Which book]₁ do you think that the sooner Mary reads ___₁ the sooner Bill will file ___₁?

Culicover & Jackendoff (1999), use the Jackendovian framework's assumption of distinct syntactic and semantic structure in part to explain the apparent contradictory behaviors seen in defining the relationship between the two clauses of the comparative correlative. The syntactic structure of a comparative correlative is paratactic and the semantic structure is one of a main clause with a lefthand subordinating clause. Comparative correlatives are not the only kind of expression for which this proposal has been made; Culicover & Jackendoff propose in their (1999) paper that intonational conditionals and left-subordinating 'and' sentences (both given earlier in this section in (76)-(77)) also have a coordinated syntactic structure and a subordinate clause in conceptual structure. These data can then be used to test the present hypothesis that the CSC applies to conceptual structure and not syntactic structure.

We expect that, like comparative correlatives, because neither the CED nor the CSC prohibits movement from either clause of an intonational conditional and left-subordinating 'and' conditionals, extraction from both clauses should be permissible. In

¹⁷ In my analysis in chapter III, I will address directly how A'-movement out of the first clause, an adjunct or specifier, can proceed in a successive cyclic fashion, namely by utilizing the operation of Sideward Movement (Nunes 1995, 2004). Nunes primarily deals with movement out of adjuncts in cases very similar to that in (98), such as parasitic gaps and Across-The-Board (ATB) data. Like (98), these data have two gaps, both in A-positions. I do not address data like (98) in my analysis, but given that I assume Sideward Movement, an analysis of these data similar to that proposed by Nunes for parasitic gaps and ATB could be straightforwardly applied to a licit derivation of (98).

the case of left-subordinating ‘and’ conditionals, (102)c demonstrates that movement of the object out of the first clause is possible for some speakers, even though all types of movement are not straightforwardly acceptable (see (102)a-b). The behavior of (102)c, however, is what one would expect if Culicover & Jackendoff’s proposal is correct.¹⁸

- (99) You drink another can of beer and I’m leaving
 (100) _{CP}[You drink another can of beer] and _{CP} [I’m leaving]
 (101) If you drink another can of beer, then I’m leaving
 (102) a. *? [One more can of beer]₁ , you drink t₁ and I’m leaving
 b. * Which beverage₁ did you drink t₁ and I’m leaving ?
 c. ✓ That’s [the kind of poison]₁ that you drink t₁ and I’m leaving

When intonational conditionals are examined, we see that movement out of each clause is not possible. (103)-(104) show that extraction from either clause of an intonational conditional is clearly unacceptable.

- (103) a. ✓ Mary listens to the Grateful Dead ↑ , she gets depressed ↓
 b. * What₁ does Mary listen to t₁ ↑ , she gets depressed ↓ ?
 c. * I wonder what₁ Mary listens to t₁ ↑ , she gets depressed ↓
 d. * The Grateful Dead₁ , Mary listens to t₁ ↑ , she gets depressed ↓
 e. ?? This is the kind of music that Mary listens to t₁ ↑ , she gets depressed ↓
- (104) a. ✓ Mary listens to the Grateful Dead ↑ , she thinks of Jerry Gracia ↓
 b. * Who₁ does Mary listens to the Grateful Dead ↑ , she thinks of t₁ ↓ ?
 c. * I wonder who₁ Mary listens to the Grateful Dead ↑ , she thinks of t₁ ↓
 d. * Jerry Garcia₁ , Mary listens to the Grateful Dead ↑ , she thinks of t₁ ↓
 e. * Jerry Garcia is [the kind of musician]₁ that Mary listens to the Grateful Dead ↑ , she thinks of t₁ ↓

This data suggests one of two possibilities.¹⁹ Either (i) the syntactic structure of the intonational conditional’s *if*-clause is subordinate, and the movement is illicit due to a

¹⁸ It should be noted here that (102)c is not readily judged as acceptable by many speakers. This judgment, along with those of (102)a&b, casts serious doubt on the validity of Culicover & Jackendoff’s (1995) argument.

¹⁹ There are other possible explanations for the unacceptability of these examples that one could consider. One such explanation might be that the obligatory intonation at the end of each clause must necessarily be realized on the final constituent of that clause. If so, then these examples would be unacceptable because the final constituent is unrealized

CED violation, or (ii) its conceptual structure is one of a coordinated structure and the movement is illicit due to a CSC violation. Either option creates a new problem. The syntactic structure must be coordinated in order to account for the overt presence of *and*, and the conceptual structure must be one of subordinate and main clause to explain the other behaviors that lead us to understand the second clause as the main clause (e.g., tag

phonetically (i.e., it is a copy of the moved constituent). We can control for this confounding factor by inserting something phonologically overt after the moved constituent. For instance, instead of (103)a and (104)a to be the base example of an intonational conditional, instead use (i)a&b:

- (i) a. ✓ Mary listens to the Grateful Dead with Sam↑ , she gets depressed↓
- b. ✓ Mary listens to the Grateful Dead↑ , she thinks of Jerry Garcia the rest of the day↓

If we use these new examples and repeat the tests that were used to create examples (103)-(104), the results are equally unacceptable, as shown in (ii) and (iii):

- (ii) a. * What_{t₁} does Mary listen to t₁ with Sam ↑ , she gets depressed↓ ?
- b. * I wonder what_{t₁} Mary listens to t₁ with Sam↑ , she gets depressed↓
- c. * The Grateful Dead_{t₁} , Mary listens to t₁ with Sam↑ , she gets depressed↓
- d. ?? This is the kind of music that Mary listens to t₁ with Sam↑ , she gets depressed↓
- (iii) a. * Who_{t₁} does Mary listens to the Grateful Dead↑ , she thinks of t₁ the rest of the day↓ ?
- b. * I wonder who_{t₁} Mary listens to the Grateful Dead↑ , she thinks of t₁ the rest of the day ↓
- c. * Jerry Garcia_{t₁} , Mary listens to the Grateful Dead↑ , she thinks of t₁ the rest of the day ↓
- d. * Jerry Garcia is [the kind of musician]_{t₁} that Mary listens to the Grateful Dead↑ , she thinks of t₁ the rest of the day↓

Another explanation for the unacceptability of (103)-(104) is to stipulate that there is no way to simultaneously satisfy the intonational requirements of both a question and an intonational conditional. Whereas this might explain (ii)a and (iii)a, it is not clear that this explanation could be extended to cover all the examples here.

To sum up this footnote, there may be another natural class that all of the examples in (ii) and (iii) belong to other than that they all contain a moved constituent. If that natural class is identified and the data given here are explained, then the conclusions of Culicover & Jackendoff (1999) would need to be re-examined in light of this finding.

questions forming on the second and not the first clause). These data are important because the authors say they are the most closely related (syntactically and semantically) to comparative correlatives. We find that intonational conditionals do not have the behavior we predict when subjected to a critical test for subordination at syntactic and conceptual structure, thus we must seriously re-examine the analysis for comparative correlatives.

Related to the test of syntactic and/or conceptual subordination, it has been shown that some of the clauses that Culicover & Jackendoff identify as syntactically subordinate are porous to A'-movement, thus casting further doubt on the reliability of the test of islandhood as a diagnostic for identifying a subordinate or adjunct clause. For instance, standard conditionals with overt *if* permit movement out of the *if*-clause under specific predictable conditions in Spanish (Etxepare, 1998; Hornstein 2001) and English (Taylor 2006). An example of such *if*-clause extraction can be seen in (105) immediately below.

(105) ✓ [Which car]₁ does Michelle believe if she buys t₁ her insurance premium will increase?

Another more familiar example of an apparent violation of the CED is parasitic gaps (Chomsky, 1982; Engdahl, 1983). The diagnostics Culicover & Jackendoff use to determine that the first clause of a comparative correlative is not a syntactic adjunct rest heavily upon the reliability of the CED to apply to all adjunct clauses. Yet there are exceptions to the constraint. As such, the conclusion that the first clause is not a syntactic subordinate clause may be premature.

All of this data considered together suggest that the CED may not as reliable of a predictor of syntactic subordination as it has been previously conceived as being.

Beyond this empirical evidence against Culicover & Jackendoff's analysis of comparative correlatives, there are some conceptual ramifications for syntactic theory that the analysis raises. There appears to be no evidence in favor of analyzing comparative correlatives as coordinate structures. This syntactic structure is proposed for comparative correlatives via a process of elimination. Yet the two clauses are not interpreted as coordinated (because they are not coordinated at conceptual structure), the structure is not subject to the CSC (because the CSC does not apply to syntactic structures), and there is no coordinator, overt or covert. Effectively, having the status of a coordinate syntactic structure indicates nothing of significance. All things being equal, it would be surprising to discover that the syntactic structure of an expression is so benign that it cannot be detected by any method other than by process of elimination.

3.2.2 Lack of limits on the number of clauses in a comparative correlative

Den Dikken (2005) (reviewed in §5 of this chapter) raises another important concern about treating the syntactic structure of comparative correlatives as a coordinated one. As a coordinate structure, there is nothing preventing an unbounded number of conjuncts in a comparative correlative (Den Dikken, 2005). We should predict not just comparative correlatives with two clauses, but with three or four, or more. Across languages and dialects, however, comparative correlatives are biclausal. Although this problem is not addressed directly by Culicover & Jackendoff (1999, 2005), the issue could be addressed under a Jackendovian approach in terms of constructions, an alternative for which I show limitations in chapter IV of this thesis. If comparative correlatives exist in the language as a result of a unique sentential construction, this construction can be defined as a biclausal structure, as McCawley (1988) and Fillmore

(1987) do. Culicover & Jackendoff address the problems in a different way, by suggesting that speakers learn the characteristics of comparative correlatives reliably by means of universal semantic principles, and not in a unified way in the syntax. They write,

“On this view, what the child must learn is not the possibility of parataxis but the particular semantics to associate with the paratactic comparative correlative construction and its counterparts in other languages. It is surely significant that many other languages have similar constructions expressing the comparative correlative reading found in comparative correlatives, although specific syntactic properties of the constructions differ from language to language. It is as though universal semantics has a kind of meaning to express —the comparative correlation of two scales of magnitude —for which standard default mapping to syntax does not provide a complete solution; and languages therefore are forced to ‘cobble together’ some kind of mechanism to express it. We have not explored the extent to which such comparable constructions provide evidence for or against paratactic syntax. But in many cases the constructions are superficially unusual in just the way the English construction is, often appearing paratactic and often inheriting properties of comparatives and/or conditionals...”

What is implicit in this explanation is that a distinct language-specific construction for the comparative correlative arises in each language even though humans have the need to express the semantic meaning that only the comparative correlative achieves. It is the semantics that drives its biclausal syntax, not the syntax in and of itself per se.

3.2.3 Optional-*that* and consequences for the macro-syntax

Before leaving this commentary of Culicover & Jackendoff’s (1999) analysis of comparative correlatives, there is one property of comparative correlatives in English that the authors report differently than that of other researchers. The purpose of identifying this here is to synthesize the data reported in previous literature and resolve any discrepancies. Differently from what Fillmore (1987) reports (see example (2) of this chapter), Culicover & Jackendoff report that the complementizer *that* can freely appear in

either clause between the comparative + modified constituent and the rest of the clause. The two contrasting judgments are given below, Fillmore's in (106) and Culicover & Jackendoff's in (107). Both reports of the judgment are attributed to the complementizer *that* shown boldface in the examples.

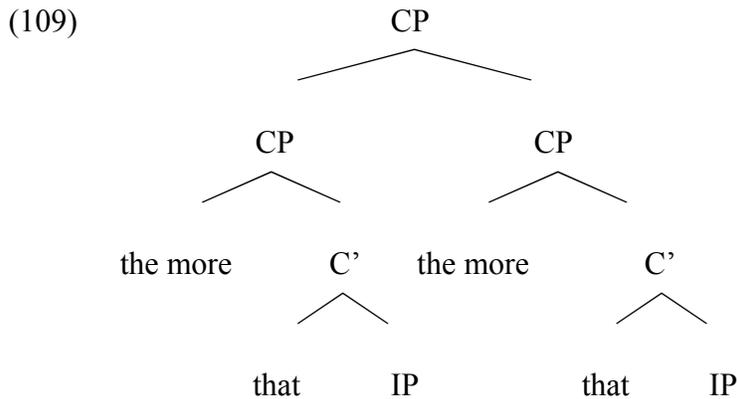
- (106) * The more that you think about the problem, the easier **that** it will be to solve.
(107) ✓ The more that you think about the problem, the easier **that** it will be to solve.

Though this observation seems to be trivial, the effect of what the best characterization of the data are is twofold; Culicover & Jackendoff conclude that (i) the two clauses of a comparative correlative are identical in their syntactic structure and (ii) that if standard assumptions of a syntax-centric grammar are followed, CP recursion must occur in both clauses of the comparative correlative in order to account for this “optional *that*-insertion” phenomenon. Both of these conclusions support the broader theoretical framework that the authors propose, that syntactic and semantic structures are separate entities. It may be that the differences are merely a reflection of dialectal variation. After we examine the conclusions made based on this data, we will consider whether these same conclusions hold if the contrast can be attributed to dialectal variance or idiolect. We will also consider data collected from naïve speakers in a setting where they were unaware of the contrast between examples like (106) and (107).

The first of the conclusions, that the two clauses are identical in their syntactic structure, is straightforwardly clear given the lengthy explanation in the previous subsection. The second conclusion requires a brief explanation. If the complementizer *that* can appear in the aforementioned position, this clause must be a CP, with the comparative + modified constituent forming a constituent and fronted in this clause. This suggests that whatever label is given to the comparative correlative, the phrase structure

rule permitting its creation will be in the form $X \rightarrow CP CP$. An entire comparative correlative can be embedded under an appropriate predicate and preceded by another complementizer, as in (108), suggesting that the label X in the PS rule just defined is either IP²⁰ or CP. Regardless of whether it is IP or CP, Culicover & Jackendoff note that the theoretician is “faced with the uncomfortable choice of inventing an entirely new category for the [comparative correlative] construction...or else permitting an unconventional expansion of IP or CP into two CPs” (Culicover & Jackendoff 1999:546). Further, if the label of the comparative correlative is CP, this constitutes an instance of CP recursion, as shown in (109).

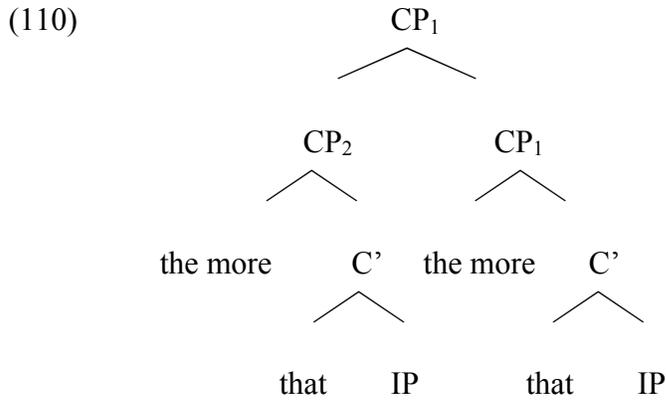
(108) Mary thinks that_{CP/IP}[CP[the more that Tom studies,]_{CP}CP[the better he’ll do on the exam]]



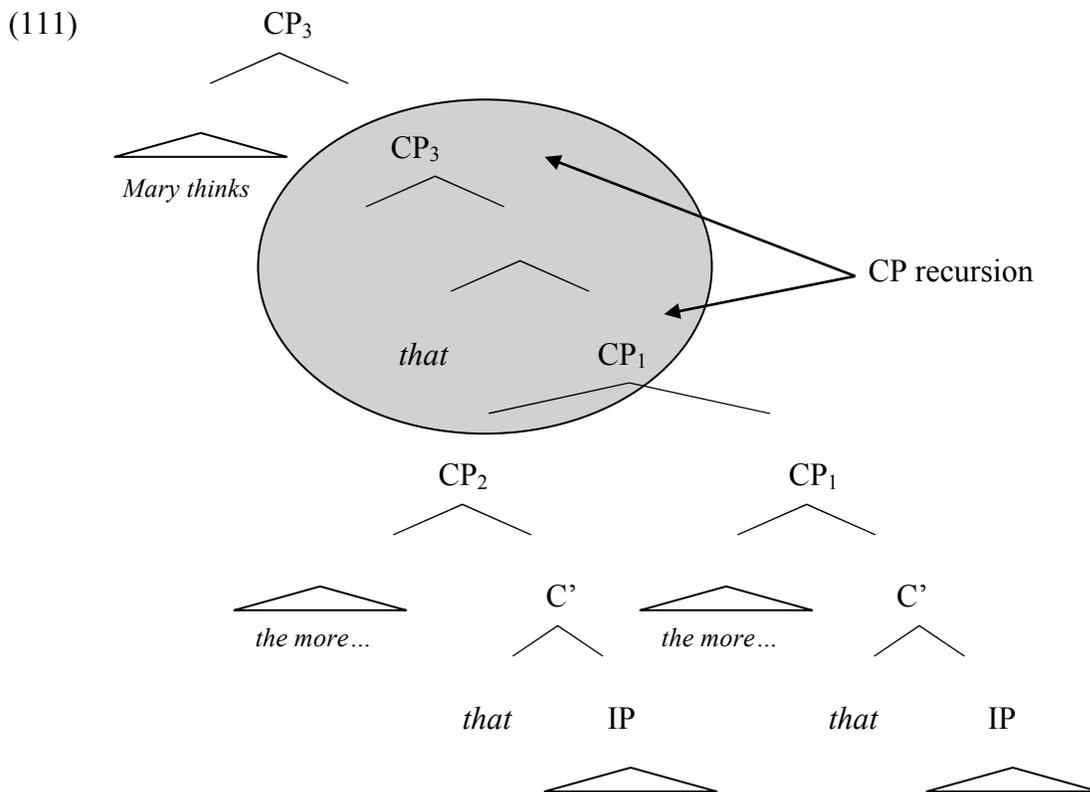
Let us first assume based on the argumentation in the previous subsection that the two clauses are not in a paratactic relationship, but rather that the second clause is the matrix clause and the first is subordinate to the second. The two clauses are not on the same level hierarchically, then. As we will see in the next chapter, the body of empirical data supports an analysis in which the first clause is adjoined to the second. If we take

²⁰ In other later writings in minimalist syntactic theory, TP (Tense Phrase) is used instead of IP. I use IP here to reflect the exact proposal of Culicover & Jackendoff. For the purposes of argumentation here and in chapter III of this thesis, I assume IP = TP.

this to be the correct structure, the labels in (109) are correct, but require additional annotation, as in (110).



What remains is the question of CP recursion. Considering the expression in (108) again, and taking in account the new labels in (110) and putting them into the structure in (109), (111) is the new tree that results. The problem of CP recursion still remains, as shown by the circled portion of the structure.



To solve this given the assumptions spelled out above, three options are available: (i) assume that the phrase labeled as ‘CP₃’ is not a CP and relabel it as a phrase of some other category, (ii) assume that phrase labeled as ‘CP₁’ is not a CP and relabel is as a phrase of some other category, or (iii) resolve that CP recursion is not a serious problem to a theory of grammar. I suggest here that (iii) may follow from (ii), and that these solutions taken together are the best option.²¹

What if Fillmore’s report of the data is correct and the optional presence of *that* in the second clause results in unacceptability of the whole expression? This would suggest that no complementizer heads the second clause, and as such it is not a CP. Before we even delve deeper into the data in English, it should be noted that no other language in which comparative correlatives have been investigated thus far allows insertion of a complementizer in this position in either clause. Therefore whatever conclusion we come to for the English data will only be applicable for an analysis of comparative correlatives in this one language. But we will look closer at this in English nonetheless. When I initially sought judgments of this data by native speakers, I found mixed results regarding optional *that*. Naïve informants tended to give an initial judgment, and then second-guess that judgment only two or three sentences later. They were quick to realize what the contrast between two items in a minimal pair was, and started providing explanations for why *that* should or should not occur in this position. Using the methodology of traditional grammaticality judgments did not provide clear results, therefore in order to gather

²¹ In my analysis presented in the next chapter, the second clause is indeed labeled as CP, and our problem resurfaces. Therefore when we reach that bridge in chapter III, we will ultimately cross it and solve this problem by proposing that what appears to be CP recursion can be recast as an extended CP domain.

judgments on this specific feature of the expression, another methodology was required. Henceforth this phenomenon will be referred to as ‘optional-*that* insertion.’

I devised a questionnaire that seven monolingual English-speaking adults completed in order to discover what the properties of optional-*that* insertion were. In this questionnaire I investigated the factors in (112) that could account for whether speakers allow optional-*that* insertion:

- (112) a. individual speaker variation
b. type of phrase being modified by the comparative
c. which clause the *that* was inserted into
d. parallelism of the two clauses

The full details of this data collection and the results are in the Appendix. The general finding of the research is that the factor in (112)c, which clause the *that* was inserted into, is the only one that appears to have any bearing on optional-*that* insertion. Optional-*that* insertion is readily permitted in the first clause, but dispreferred in the second, as seen in the summarized data for all test items for all speakers in Table 1 below. When *that* is inserted into the first clause, there are no judgments of unacceptable, contrasting with *that*-insertion into the second clause in which ~33% of items are judged unacceptable. Even more convincing, when *that*-insertion is in the first clause alone, 84% of responses indicate that this change is the same or better than the original sentence. This finding suggests that the features of this functional head may be different in each clause.

Table 2 – average of all speakers²²

	Unacceptable	Acceptable
<i>That</i> in both clauses	34% (17/50)	42% (21/50)
<i>That</i> in first clause alone	0% (0/50)	84% (42/50)
<i>That</i> in second clause alone	32% (16/50)	40% (20/50)

The results here demonstrate that the two clauses are not equal in the eyes of speakers with respect to optional-*that* insertion. Whereas no speaker rejected any sentence that contained *that* only in the first clause, 40% of the sentences which contained *that* in the second clause were judged as unacceptable. What do these results indicate regarding the structure of comparative correlatives and the syntactic label of the second clause? It indicates that for some speakers who reject optional-*that* insertion in the second clause in all cases (like Fillmore), the second clause is not a CP. For these speakers, CP recursion in comparative correlatives is not a possibility. Other speakers do allow optional-*that* insertion in the second clause, like those Culicover & Jackendoff report on and some of the speakers in this study. For speakers who permit this in their idiolect, we return to our original question of whether this necessitates the label of the second clause being CP and the resulting structure creating potential CP recursion. I suggest that for these speakers we consider a fourth option not considered earlier, that what appears to be CP recursion constitutes a much richer CP domain including more specific phrase labels not seen in reduced structures like (111). Two facts already covered

²² The rows in this table do not add to 100% as a result of experimental design. I designed the questionnaire to make it difficult to score an item “unacceptable.” For an item to be scored as “acceptable”, it had to be judged the same or better than all items compared against it; for an item to be scored as “unacceptable”, it had to be judged not only as worse than another item, but also noted by the speaker as something they would never expect a native speaker of English to say. As a result, many items were scored as neither acceptable or unacceptable. See Appendix for full details.

here suggest that this is a viable proposal. Comparative correlatives in no language other than English have this property, and it has been documented cross-linguistically the two clauses differ syntactically and morphologically. Secondly, Culicover & Jackendoff (1999, 2005) and other analyses of comparative correlatives we will look at later in this chapter (Beck, 1997; den Dikken, 2005; Lin, 2007) and in this thesis (chapter III) propose a complex structural analysis for the portion of each clause corresponding to the string *the more/less/-er X*. Given the complexity of this domain, the apparent contrasts between the two clauses with respect to this domain, and the contrasts between various analyses with respect to this domain, I leave the task of solving apparent CP recursion as having possible solutions and revisit this issue in chapter III.

3.3 Important points to note

Culicover & Jackendoff (1999) contribute new data on comparative correlatives in English. Most notably, they note that A'-movement like topicalization and relative clause formation is possible out of either clause. In addition to this data, I added to it in this chapter and demonstrated that this A'-movement is even more general than Culicover & Jackendoff describe. A'-movement of a *wh*-phrase for *wh*-question formation is licit, as is ATB-like movement of the same item out of both clauses (see (98)). In addition to this large finding, Culicover & Jackendoff (1999) contribute the following important data:

- They contribute a large body of data that is normally taken to indicate the syntactic status of a clause as a subordinate clause or the main clause. These data include tag-questions, imperative mood, subjunctive mood, *how much*-questions, and binding tests of logophoricity and variable binding.

- Despite this large body of data normally taken to indicate that the syntactic status of a lefthand clause is a subordinate adjunct, Culicover & Jackendoff (1999) note one characteristic of the clause that is not predicted: A'-movement out of this clause (topicalization and relative clause formation) is allowed. A'-movement out of the second clause is also acceptable, in fact, as acceptable as A'-movement out of the first.
- Regarding optional-*that* (examples like *the more (that) you think about the problem, the easier (*that) it will be to solve*, seen in (2), (72) and (106)-(107), Culicover & Jackendoff report their own judgments of this phenomenon which differ from Fillmore's (1987). This prompted my deeper investigation into the data, leading to the conclusion that, generally speaking, speakers prefer to permit the *that* in the first clause but not the second. This generalization is far from an absolute and there appears to be a good bit of variation from speaker to speaker.
- Regarding the obligatory *the* that shows up at the start of each clause, Culicover & Jackendoff (1999) classify this morpheme as something other than the definite determiner in a determiner phrase (i.e., necessarily associated with an NP). For Culicover & Jackendoff, *the* is the definite determiner of a quantifier, corresponding to the comparative morpheme which is obligatory in English.

3.4 A last note

I digress briefly here to clarify my criticisms in this section. Nothing I have argued in the review of this paper has suggested that the fundamentals of the

Jackendovian framework are in error. A theoretical framework which requires separate structures for syntax and for semantics may very well be a viable proposal and the correct characterization of the model for Human Language. However, my arguments here have shown that the proposal that has been made for a specific body of data, comparative correlatives, does not have adequate empirical coverage in English and consequently cannot be the correct explanation for this data. Revising the proposed analysis of comparative correlatives within the Jackendovian framework lies outside the ranges of the current research goals of this thesis, and I leave such an endeavor for another project, or another researcher.

4. Head Driven Phrase Structure Grammar (HPSG)

4.1 Summary of the papers

Thus far we have seen two proposals framed within Construction Grammar (Fillmore, 1987; McCawley, 1988), and a third which implicitly includes the use of constructions. We will change gears a bit and move to the framework of Head driven Phrase Structure Grammar (HPSG), which crucially relies upon the postulate that sentential constructions exist. In a series of papers, (Borsley, 2003; Borsley, 2004; Abeillé, Borsley & Espinal, 2006), Borsley along with colleagues develop an analysis for comparative correlatives across four languages (Polish, English, French and Spanish) within the framework of HPSG. The proposal builds upon the previous three by making use of sentential constructions, and extends the analysis by formalizing it. The goal is to account for the properties of comparative correlatives that we have already seen which sometimes appear to be contradictory or enigmatic.

In the interest of making the details and ideas of this paper as clear as possible, I will use terminology and shorthand notation unique to HPSG as little as possible, and instead rely upon wording which extends to other syntactic frameworks. Though these details are, of course, important within the HPSG framework, and findings within a specific theoretical framework are important, noting them here would detract from the goals of this thesis. The authors of this proposal within HPSG, along with the authors of the previous three proposals we have already seen (Fillmore, 1987; McCawley, 1988; Culicover & Jackendoff, 1999), are clear to state that one of the main theses of their proposal is that a strictly compositional theory of syntax, more specifically a transformational or minimalist theory of syntax, cannot adequately account for the range of behaviors that comparative correlatives exhibit. Citing Fodor's (2001) challenge that data deemed as 'peripheral' should stand as the data that force researchers to choose between theories of syntax, Borsley (2003) aims to demonstrate that comparative correlatives are data that should push the model of Human Language towards an HPSG approach to the theory of syntax. Independent of this, the analysis developed and put forth by Borsley and colleagues, like most theoretical proposals, has ramifications within its own framework. For instance, one of the principle findings of this proposal is that the Generalized Head Feature Principle²³ (Ginzburg & Sag, 2000) is a useful and essential inclusion into this framework. The principle constitutes a default statement that a head

²³ The Generalized Head Feature Principle is an extension of Borsley's (1993) and Pullum's (1991) Head Feature Principle.

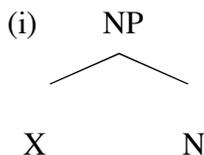
phrase and its head-daughter (i.e., a daughter of a head) have the same syntactic and semantic properties unless some other constraint requires these properties to differ.²⁴

Comparative correlatives stand as data that exemplify an outside constraint that requires the properties of head phrase and head-daughter to differ. Again, I do not discredit these findings or consider them irrelevant; however, to some extent I will abstract away from these specific findings in order to evaluate the proposal in light of proposals outside of the theoretical framework that HPSG provides.

4.1.1 Polish and English

The analysis of comparative correlatives in HPSG begins with Polish (Borsley 2003). Polish comparative correlatives unsurprisingly are comprised of two clauses, the first one which is subordinate and begins with the marker *im* ('how.much'), and the second which is the main clause and contains the marker *ty* ('that.much') which appears

²⁴ As clarification for any reader unfamiliar with the terminology in HPSG, head phrase refers to a phrase label (e.g., NP, VP, etc.) and a head-daughter refers to a daughter of that head phrase which bears its same categorical label (e.g., N, V). In (i) below, then, NP is the head phrase and N is its head-daughter.



The Generalized Head Feature Principle (GHFP) builds endocentricity into the structure of any phrase, eliminating an appeal to an explicit notation written into every phrase in order to capture this generalization. As stated above in the text, the GHFP is a default generalization which does not apply in every phrase, i.e., other rules can allow a violation of endocentricity if necessary. This is done via constructions in the grammar that can provide non-endocentric structures. In this way, phrasal constructions become essential to the grammar inasmuch as the ability to violate endocentricity is essential to the grammar. On that note, the notion that a phrase can bear a label (whatever that means) different from any of its daughters is one that does not comport with the basics of a minimalist approach to grammar. I leave this contrast to be explored elsewhere, as it demands a much lengthier form.

before a comparative word and is frequently fronted (though not always so). The head clause²⁵ status of the *tym*-clause is established through familiar tests we have seen earlier, such as the ability to host subjunctive or imperative mood. For English, this proposal concurs with previous analyses that conclude that the second clause is the head clause and the first is a subordinate clause. When the *tym* is fronted, the gross structure of a Polish comparative correlative is as in (113). This is very similar to what is proposed for English, as in (114).

(113) [[*im*...]...] [[*tym*...]...]

(114) [[*the*...]...] [[*the*...]...]

Each clause in Polish is given the name *im*-clause or *tym*-clause, and the fronted constituent is an *im*- or *tym*-phrase. A comparative word appears in both clauses, immediately following *im* or *tym*. In this way, the marker (*im* or *tym* in Polish, *the* in English) and the comparative are taken together to form a constituent. In English, a *the*-phrase is a constituent composed of *the*, a comparative word, and the constituent it modifies. The phrase label of a *the*-phrase is that of the modified constituent. For instance in (115) the *the*-phrase in the first clause is underlined. Because the modified constituent is *books*, a noun, the entire constituent is an NP. In English, a *the*-phrase can be NP, AdvP or AP ((116)-(117)).²⁶

(115) NP[The more books] I read, the more I understand

(116) The more carefully I read books...

(117) The more careful we are...

²⁵ The term “head clause” is used in this section to reflect the terminology as it is used in HPSG, namely the term used for what is a main clause or matrix clause in minimalism.

²⁶ A comparative correlative like that in (115) demonstrates that there need to be more options than just these three phrase types. The *the*-phrase is either just *the more* or it is the entire second clause *the more I understand*. Through this series of papers, there is no mention of how to deal with clauses where it appears that the comparative is modifying an entire IP (a.k.a., TP, S).

There is evidence that the *im*- and *tym*-phrases in Polish are fillers for a gap within the clause that they are also within, such as case-marking on a noun within this phrase. We have seen that the same has been proposed in English for Borsley's (2004) *the*-phrases by Culicover & Jackendoff (1999) and Fillmore (1987). Borsley (2004) notes that the gap within the clause obeys island conditions. In this way, the clauses of comparative correlatives are head-filler clauses (using the terminology of HPSG) and as such have the same macro-syntax as *wh*-interrogative clauses like (118). There is a contrast between head-filler constructions that contain *wh*-words and *the*-phrases however. *Wh*-words can pied-pipe a preposition along with them; comparative correlative *the*-phrases cannot (119). English comparative correlatives can contain a PP, however (120)a-b. The generalization made for this is that in English comparative correlative clauses, *the* must be the first element. This is not the case for *im* and *tym* in Polish. The comparative correlative markers *im* and *tym* in Polish can be preceded by a pied-piped preposition in examples like (119), as in (121) (Borsley's example (17) taken from a Polish corpus).²⁷

- (118) How many people did Kim talk to?
 (119) a. ✓ To how many people did Kim talk?
 b. * To the more people Kim talks...
 (120) a. ✓ The more [out of breath] I am...
 b. ✓ The more [under the weather] I am...

²⁷ I assume here that Borsley's use of the word "can" in claiming that *im* and *tym* CAN be preceded by a pied-piped preposition is used because this example has come from a corpus and the speaker was not available to verify that the preposition MUST be in this position and cannot be stranded in-situ. For speakers of other non-P-stranding languages (i.e., Spanish, some dialects of Brazilian Portuguese), the preposition in these types of comparative correlatives is and must be pied-piped.

(121) Z im dawniejszych epok pochodzi probka badana. ta
 from *IM earlier* epochs comes sample investigated this.*INS*
 metoda tym blad jest wilkszy.
 method.*INS* *TYM error is greater*
 ‘The earlier the origin of the sample examined by this method the greater is the error.’

English and Polish comparative correlatives differ on (at least) two counts.

Fronting of *the*-phrases in both clauses in English is obligatory; in Polish, only the *im*-phrase must front, and the *tym*-phrase may appear in-situ. Secondly, the order of clauses in English is fixed, whereas the order of the *im*- and *tym*-clauses is free in Polish. This crosslinguistic contrast is attributed (in part) to the homophony in English’s two clauses, as opposed to Polish’s contrasting *im* and *tym*. In order for the order of the clauses to be reversed in English, the homophony must be eliminated, thus the ICC lacks a fronted *the*-phrase (122).

(122) This vacation costs more money, the longer we stay

Using English data, Borsley (2004) argues that comparative correlatives, *if-then* conditionals and *as-so* sentences (123) form a class of correlative constructions in which each has a corresponding “reversed” correlative construction. The order of the clauses is reversed in the reversed constructions and the marker at the start of the main clause (*the*, *then*, and *so* respectively) is dropped obligatorily.

(123) As I read more, so I understand more

From this collection of related sentences, a principled family of constructions is developed that adhere to a collection of principles and constraints. Borsley (2003, 2004) argues that a hierarchy of constructions like that proposed by Ginzburg & Sag (2000) is viable and needed in the theory as evidenced by the formalism proposed here for comparative correlatives. A hierarchy of constructions creates a syntactic structure in

which the lexical specifications for higher constituents have features and values of those features that are inherited from lower constituents. If I understand this correctly, this is very similar to the idea McCawley (1988) proposed for comparative correlatives using data from English, Mandarin and German in that lower constructions (comparatives and conditionals for McCawley) are part of a larger construction (comparative correlative) and thus the larger expression has properties similar to the lower constructions. In this way, we can in part take this HPSG account of comparative correlatives as an extension of McCawley's original proposal in Construction Grammar.

4.1.2 French and Spanish

Moving further into the crosslinguistic investigation of comparative correlatives, Abeillé, Borsley & Espinal (2006) continue developing the HPSG analysis of the data with data from French and Spanish. Again, both French and Spanish comparative correlatives consist of two clauses. Like most of the other languages we have seen, a fronted phrase must appear at the start of each clause. In French both clauses begin with the comparative *plus* ('more') or *moins* ('less'), and the only element that can precede this comparative is a predicative preposition *en* or *de*. The fronted phrase can be one of four phrase types then – AP, AdvP, NP or PP. Like what is proposed for English and Polish within this framework and what is proposed in other frameworks as well, the clauses show evidence of being head-filler clauses. Unlike what was reportedly seen in English by McCawley (1988), future morphology can appear on the verbal domain in the first clause.

There is a split among French speakers with respect to whether they permit subjunctive mood to be hosted on the verb in the first clause. This is relevant because this

is a test of whether it is a subordinate clause. By test of clitic subject inversion, the first clause acts like a main clause. The same is true of tests of movement (a constituent can move out of the first and second clause with equal ease). If speakers allow the first clause to host subjunctive mood, it is difficult to conclude that it is a subordinate clause. Under standard assumptions, we expect subjunctive mood not to be hosted on a verb in a subordinate clause. However, in the case of the first clause of a comparative correlative, some French speakers allow subjunctive mood on the verb in the first clause, but only if it is also on the verb in the second clause. A second group of speakers do not allow subjunctive mood on the verb in the first clause under any circumstances. Thus it appears that in French some speakers treat the two clauses as entirely symmetric, while other speakers treat the first as subordinate and the second as a main clause. By symmetric, the authors do not comment on whether symmetric is paratactic or coordinated as Culicover & Jackendoff (1999, 2005) propose.

In Spanish, similar to Polish, the fronted phrase of each clause is characterized by the marker *cuanto* ('how.much') in the first clause and *tanto* ('that.much') in the second. This marker is immediately followed by a comparative. Again, just as in French and English, this fronted constituent demonstrates unbounded dependency. The phrase type of the fronted phrase can be AdvP, AP, NP or PP. When the fronted phrase is a PP, the marker *cuanto* or *tanto* must follow the preposition. Each clause is a type of head-filler phrase and both clauses must be finite. The first clause may have future morphology (like French, but unlike English as reported by McCawley (1988)).

Spanish has two different constructions for the comparative correlative. The first includes *cuanto* and may include *tanto* (124). In this construction, the two clauses display

asymmetry with respect to hosting mood and allowing movement out of the clauses. Movement out of the first clause is not possible. In other words, the second clause is a main clause and the first is a subordinate clause. The second does not include *cuanto* or *tanto* and often includes the conjunction *y* ('and') between the two clauses. In this construction, the two clauses display symmetry with respect to hosting subjunctive mood and permitting movement out of the clauses. Movement out of both clauses can occur, but must happen together. This suggests that 'across-the-board' movement is the only kind of movement that will enable movement out of the first clause. The authors conclude that in this kind of construction it is not clear that the first clause is subordinate to the second.

- (124) *Cuanto más leo (*y) (tanto) más entiendo*
*how.much more I.read (*and) (that.much) more I.understand*
 "The more I read, the more I understand"
- (125) *Más leo (y) más entiendo*
more I.read (and) more I.understand
 "The more I read, the more I understand"

There are further contrasts between the two kinds of Spanish comparative correlatives. In the symmetric pattern (125), the order of the clause is freer than in the asymmetric pattern (124). In short, the authors conclude that there are two different kinds of constructions available in Spanish, and these two constructions differ both syntactically and semantically.

This new crosslinguistic data is dealt with in HPSG by appealing to sentential constructions and inheritance of features of constructions. Comparative correlatives belong to a larger family of correlative constructions which inherit their properties from more general (i.e., not peripheral) constructions of the language. By appealing to this notion of constructions along with proposing general constraints to phrase type rules, the

various crosslinguistic behaviors can be accounted for provided that an appropriately prescribed construction exists and lexical entries are able to have rich and complex feature matrices. It should be clear that this HPSG treatment of comparative correlatives rests deeply in the assumption that sentential constructions exist. Constructions are the building blocks of the derivations and expression, so if constructions do not exist, the proposal is left somewhat null. If any conclusions were reached that found that sentential constructions did not exist, this finding would necessarily deal a hard blow to any analysis formulated within the HPSG theoretical framework.

Lastly, I note some data points that Borsley addresses that are discussed in previous papers and previously in this chapter. Borsley (2004) addresses omission of the copula verb in English and proposes that this can be solved by adding a few features to lexical entries. Specifically, he proposes that *be* is the only verb that can have a value of *none* for its PHON (phonetic) feature, and that the *the*-clauses of a comparative correlative would have the option of a non-phonetically realized verb. By necessity then, the verb would be silent. The second data point previously discussed in this chapter is optional-*that* insertion. Borsley (2004) cites Culicover & Jackendoff's (1999) data that this *that*-insertion can occur freely in either clause. As such, this means that in a head clause a complementizer is appearing between a filler (the *the*-phrase) and the clause that contains the coindexed gap. Assuming this is accurate, the head clause of a comparative correlative is unusual in that in this respect. Borsley notes that Chomsky & Lasnik (1977) devote much of their argumentation to why a complementizer in this position should be universally disallowed. I will discuss the consequences for the proposal of Chomsky & Lasnik (1977) briefly in my commentary on this paper in the next subsection.

4.2 Commentary

It is implicit throughout this formal treatment of comparative correlatives crosslinguistically that the markers of clauses in each language, such as *the* in English and *im* and *tym* in Polish, are instances of the same element. Given that the elements in Polish and Spanish are given glosses of ‘how.much’ (*im* and *cuanto*) and ‘that.much’ (*tym* and *tanto*), it is not straightforwardly obvious that *the* in English comparative correlatives is the same object. Further, there is no marker in French that corresponds to any of the markers in the other languages, and the authors (2006) note that in French comparative correlatives no determiner or non-predicative preposition can precede the comparative morpheme *plus* or *moins*. As we will see in my analysis in the next chapter, this non-parallelism should lead us to investigate whether these markers are instances of different syntactic elements, rather than assume they are instances of the same syntactic elements.

Chomsky & Lasnik (1977) propose that a complementizer should be universally disallowed in a position between a filler and the clause that contains the coindexed gap. In the case of optional-*that* in either clause of the comparative correlative, there is an apparent violation of this universal with respect to *that* appearing between the “*the*-phrase” and the clause containing the gap site. If Chomsky & Lasnik’s (1977) arguments eliminate the possibility of any head clause allowing optional-*that* insertion as we have witnessed in English comparative correlatives, this casts a shadow on whether the proposals of that paper are accurate. In light of this observation as well as the discussion of this phenomenon in §3.3, I suggest that further investigation of this property in comparative correlatives should be conducted. Clearly optional-*that* insertion in English

comparative correlatives is not a freely available as Culicover & Jackendoff (1999, 2005) characterize it as being. Yet there appear to be speakers who do indeed allow this insertion to take place in a main (head) clause.

4.3 Important points to note

There are three important data points that are contributed by Borsley (2003, 2004) and Abeillé, Borsley & Espinal (2006). They are the following:

- These papers contribute data outside of English, the most important of which for the proposal put forth in chapter III of this thesis is that comparative correlatives often times appear with a quantifier at the start of each phrase. This is the case for Polish and Spanish, but not French or English.
- In all these papers, it is concluded that the second clause (linearly) is the main clause (head clause) of the expression by virtue of the fact that it hosts subjunctive and imperative mood (seen in Polish).
- As it directly relates to the description of comparative correlatives given in chapter I, example (12)d, Borsley (2003) provides a crosslinguistic example demonstrating the non-obligatory criteria that the word order of a clause is non-canonical. In Polish, the second clause (the main clause, or head clause as it is termed in HPSG), is marked by the presence of the quantifier *tym*; the *tym*-clause does not have to be fronted and the word order for that clause can be what is canonical for the language.

5. Strictly compositional syntax, den Dikken (2005)

5.1 Summary of the paper

In response to Culicover & Jackendoff (1999), den Dikken (2005) proposes that comparative correlatives can indeed be accounted for in a compositional grammar (i.e., one that does not rely upon the existence of constructions), and more specifically a compositional grammar that assumes Principles & Parameters and Universal Grammar (UG) as the tools for language acquisition. This kind of an approach is in stark contrast to the previous syntactic analyses we have seen thus far. The main thesis of the paper is that when crosslinguistic data of comparative correlatives are examined, clear patterns emerge and it becomes readily apparent that the expressions are not *sui generis* as previously proposed, but similar to other types of sentences seen across languages. Correlatives, which are common in Dravidian languages, look much like comparative correlatives. As such, it is wise to look at comparative correlatives as a type of expression built by similar grammatical rules as ordinary correlatives are.

The crosslinguistic data in this paper are from the following languages: Hindi, Latin, French, Russian, Polish, Czech, Serbo-Croatian²⁸, Hungarian, Modern English, Middle English, archaic English, Dutch, German, Greek, Khalkha Mongolian, Berber, and Turkish. Some of the data are examples repeated from previous works (e.g., Polish and Greek are from Borsley 2003). The languages which play a key role in den Dikken's proposal are French, Russian and Hungarian, and the Germanic languages (Modern English, Middle English, archaic English, Dutch, and German).

²⁸ This is the language name by which the data is identified by den Dikken.

The first point of this proposal is to look at correlatives, taking Srivastav's (1991) classic examples from Hindi:

- (126) [IP [CP *Jo* *laRkii* *khaRii* *hai*] [IP *vo* *lambii* *hai*]].
 REL *girl* *standing* *is* *DEM* *tall* *is*
 'Which girl is standing, that (one) is tall.'

In Srivastav's analysis of correlatives, the correlative clause is closely related to free relatives. It contains a relative pronoun (*jo* in (126)) which is coindexed with a demonstrative pronoun (*vo* in (126)) in the main clause. Given that each of the clauses of a correlative appear to have markers, it is best to next look at comparative correlatives in Hindi.

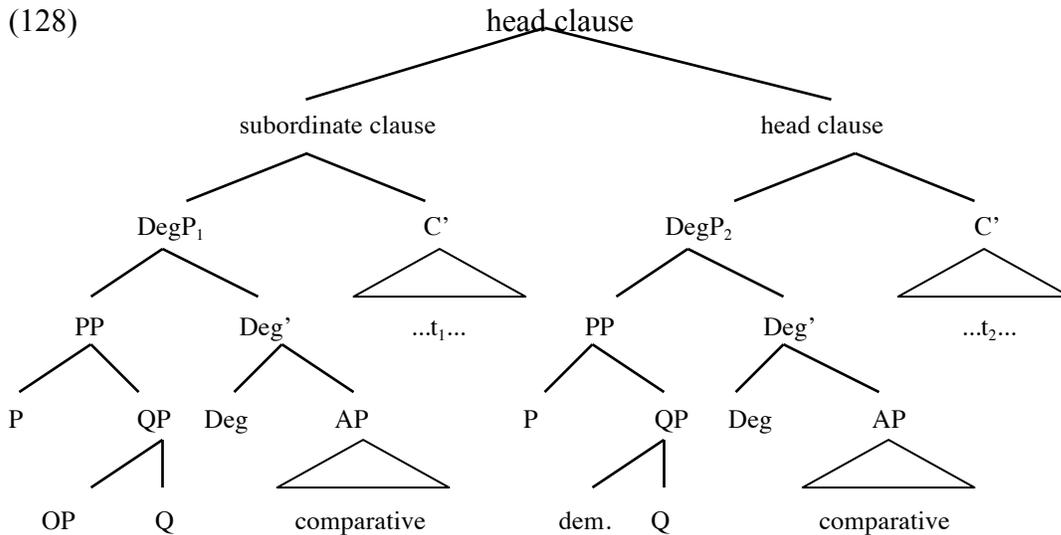
- (127) [IP [CP *Jitnaa* *suuraj* *chamk-aa*] [IP *utnii(-hii)* *ThanD*
 how-much.MSG *sun.M* *shine-PF* *that.much.F(-only)* *cold.F*
 baRh-ii]]
 increase-PF.F
 'The more the sun shone, the colder it got.'

We see that the comparative correlative has a very similar structure, with a marker at the start of each clause, *jitnaa* and *utnii*. These markers are inflected, as shown by the gloss of the suffixes on each morpheme. Given the examples above (126)-(127), den Dikken concludes that the link between the two types of expressions is made and the next step is to look at other crosslinguistic data in order to confirm the hypothesis that comparative correlatives have a syntax that is very similar to standard correlatives.

Along this line of reasoning, den Dikken (2005) proposes a non-construction grammar analysis that analogizes comparative correlatives to regular 'garden variety' correlatives. He proposes that the label for the expressions – comparative *correlative* – is appropriate, and that the necessary lexical ingredients of the expression lead to projection of a structure like (128) crosslinguistically. Den Dikken is explicit to say that his is not a

construction-specific proposal; he is not saying that comparative correlatives *are* correlatives. The lexical and functional components of a comparative correlative are what create the structure, not a construction. It is the learning of the lexical ingredients that enables the child to include comparative correlatives into their grammar.

(128)



This structure resembles correlative constructions in that (i) the subordinate clause is obligatorily to the left of the head clause, (ii) the subordinate clause includes an operator as the lefthand sister of Q, and (iii) the head clause contains a demonstrative as the lefthand sister of Q. It is not necessary for all lexical heads and functional heads to be filled overtly in a language. For instance, in English, the Deg⁰ is the lexical item *the* that obligatorily appears at the start of both clauses, and the AdjP includes what I have called the comparative constituent. All positions in the lefthand PP are null heads for English. As we saw in the last section in French, each clause in a French comparative correlative begins with a comparative *plus* ('more') or *moins* ('less') and only a predicative preposition can precede it. In considering the cases where nothing precedes the comparative, den Dikken says that in both clauses of French comparative correlatives, the

Deg⁰ and all positions in the PP are null. Of the languages that are fit into this correlative template, Hungarian is the only language that has a recognized correlative construction.

Den Dikken argues that this structure and analysis explain two properties of comparative correlatives that are left unexplained by the previous approaches reviewed here. First, the correlative skeleton forces the subordinate clause to precede the matrix clause linearly. Secondly, the correlative skeleton explains why these expressions consist of two clauses, no more and no less. There is no explanation given to indicate which lexical and functional components are responsible for these properties of comparative correlatives or correlatives. Rather it is assumed that the relative clause of correlatives is obligatorily present and fronted, therefore the same properties hold for comparative correlatives.

Additionally, the structure in (128) provides an explanation for a curious property of the comparative morpheme in comparative correlatives – it cannot take measure phrase nor a *than*-complement (Beck, 1997 and references therein), demonstrated here in (130)-(133).

- (129) ✓ The taller John is, the more baskets he will score
- (130) * The taller than Bill John is, the more baskets he will score
- (131) * The taller John is, the more baskets than Bill he will score
- (132) * The three inches taller John is, the more baskets he will score
- (133) * The taller John is, the four more baskets he will score

It is implied that the lexical and functional components of this structure build only this structure and no other. Thus, if the specifier of the degree head must be a PP, and that PP must only take a QP as its complement, then there is no position available for a measure

phrase to occupy. Similarly, it can be reasoned that the position a *than*-clause would occupy is also not available in this structure.

As I stated earlier, of the languages den Dikken (2005) considers for the analysis, only one, Hungarian, has a recognized correlative expression. In the paper, it is suggested that English has correlatives, such as den Dikken's example in (134) (2005:529).²⁹

(134) Just as correlatives in general are UG-constrained, so are comparative correlatives.

5.2 Commentary

Den Dikken's (2005) proposal is framed within theoretical assumptions similar to those of this thesis. It assumes that constructions are not part of the grammatical system, and that language acquisition proceeds via setting of parameters and learning principles, all of which is available to the child via Universal Grammar. Given that these assumptions are shared by the proposal in this thesis, it is reasonable to ask, why go any further? Doesn't this analysis account for the properties of comparative correlatives in a way that doesn't resort to ad hoc conjectures or extra theoretical machinery? Comparative correlatives are like correlatives, which are like free relatives. If we follow the logic, it should stand to reason that the problem is solved. There are a few reasons why this analysis doesn't solve the challenge of construction-based grammars. Further, there are issues with this analysis that need to be addressed to achieve a more fleshed-out discussion within a UG-based approach. The four issues I raise in this subsection are as follows: (i) a derivation of the correlative skeleton seen in (128) is not provided, and

²⁹ It should be noted that this expression is of the same form as Borsley's (2004) "as-so" sentences (see example (123), which require use of a sentential construction from the conditional family of constructions. As reported in §4.1, the sentential construction required for comparative correlatives is also part of this conditional family of constructions.

following directly from this, (ii) it is not clear how the phenomenon of A'-movement out of either clause raised by Culicover & Jackendoff (1999) would be solved. (iii) The obligatory *the* at the front of each clause in English is a degree head (Deg⁰), leaving the comparative *more* as part of the complement of that Deg⁰, a comparative adjective phrase. Lastly (iv), there is a conceptual question about the limited instance of genuine correlatives crosslinguistically and the apparent abundance of comparative correlatives crosslinguistically.

First, there is an issue with the way this analysis is presented. The challenge put forth in previous analyses of comparative correlatives is that the syntactic behaviors of the data cannot be accounted for in a grammar unless sentential constructions are part of that grammar. As such, a derivation of comparative correlatives that shows how each head combines with the next, one that shows how the entire expression can be derived without the use of constructions, is needed. It is implied by den Dikken that such a derivation is part of the analysis he presents, in that a P&P model of language which includes UG is based on the assumption that constructions are not part of the system. Despite this, the details of how this is achieved are not present. The contrast between a construction-specific grammar and one that does not rely upon large constructions is crucial, as we have seen throughout the literature review in this chapter thus far. Despite this, there are parts of den Dikken's proposed treatment in which it is difficult to determine which assumptions he is making with respect to constructions. While discussing the structure in (128) for the first time in the paper, we read, "The microsyntactic structure of comparative correlatives that I will defend here is (30) [example (128) here in this chapter], which **at the macrosyntactic level parses the**

construction as a correlative with a relative clause functioning as the subclause (SUBCL) adjoined to the second clause (HEADCL), and at a more microscopic level analyzes the fronted comparative phrase as a DegP whose specifier position is occupied by a (typically but not necessarily prepositional) measure phrase and whose Deg head (spelled out in English as *the*) takes the comparative AP as its complement,” (den Dikken 2005:510, *emph. mine*). In the bolded portion of this sentence, we are lead to believe that the speaker parses a construction, not heads, and analyzes a subclause (a phrase) as a relative clause, rather than the heads of that clause combining and leading to a derivation of that structure. It is true that this sentence cited addresses parsing and not production; we do not necessarily take the two processes to be identical. But crucially for a proposal within the assumptions of P&P and UG, and especially a proposal setting as one of its goals to demonstrate that phrasal and sentential constructions are eliminable from the grammar while still explaining the competence and acquisition of the data, it is vital that the derivation in terms of competence be investigated. As it stands, since a derivation is not provided in this analysis, we are left without a sufficient compositional proposal for the syntax of comparative correlatives. Further, without this explicit demonstration, there are questions that can be asked about how exactly the structure in (128) is derived.

One such question is how successive cyclic A'-movement out of either clause is achieved. Den Dikken (2005) includes, discusses and extends the data presented by Culicover & Jackendoff (1999) which demonstrate that extraction from either clause is permitted. Despite this, the proposed skeleton analysis for comparative correlatives given predicts that movement out of either clause should be impossible in that it cannot proceed

in a successive cyclic fashion. Under standard minimalist assumptions, movement is step-by-step, from within a phrase, to the edge of the tree corresponding to the present phase, and then to the edge of the tree corresponding to the next highest phase. If the edge of a phase along the path to the final landing site is not available for this movement, then the movement is illicit. Putting aside the issue of the subordinate clause versus the matrix clause, neither of these clauses in the proposed structure in (128) provides a way for movement out to proceed successive cyclically. The SpecCP position of both clauses is obligatorily occupied by a DegP. This should predict that in every language, both clauses are islands to movement. Yet, den Dikken provides evidence that this prediction is not borne out in Dutch and German, similar to what Culicover & Jackendoff (1999) observe for English.

Thirdly, den Dikken analyzes English's obligatory *the* at the start of each clause as a Deg⁰ based on historical data from Old and Archaic English. While it is not unheard of to give this morpheme a treatment other than the definite determiner associated with an NP (Culicover & Jackendoff (1999) treat it as the specifier of a QP), it does raise the question of what the obligatory comparative morpheme in each clause of the English comparative correlative is. In den Dikken's structure given in (128), the comparative is contained within a comparative AP, which is itself the complement of the DegP. Ordinarily we would think of the comparative as being a Deg⁰ and the treatment of *the* as a Deg⁰ precludes this possibility.³⁰

Lastly, there is a more important conceptual question to ask about this proposal. As was stated earlier, this formal analysis is explicitly put forth as one that argues against

³⁰ Also relevant to this point is Bhatt's (2009) query about why this Deg⁰ doesn't appear anywhere else in Modern English.

the reliance upon sentential and phrasal constructions as primitives in the grammar. As such, the individual heads and the rules of their composition are all the child needs to learn in order to parse and eventually produce comparative correlatives. The proposal put forth by den Dikken (2005) places considerable importance on deriving the correlative structure that reliably is present in all languages considered, independent of whether they have correlative expressions or not. If this proposal is correct, it is curious that comparative correlatives are so pervasive in the world's languages, yet correlatives are very limited in crosslinguistically. If all language learners are able to so easily obtain (by whatever means) a correlative structure with which they can include comparative correlatives in their grammar, why do so few of the world's languages and language families have standard correlatives? Den Dikken suggests that English has correlatives ((134) in §5.1 above), but the expression does not have the characteristic properties of correlatives, such as one clause being a relative clause and a semantically-equivalent expression using another strategy of relativization, or an indefinite relative pronoun in the correlative clause which is then coindexed and coreferential with a demonstrative in the main clause. Whether or not one takes this example as evidence of correlatives in English, the question remains, why are English speakers not able to construct more recognizable correlatives, like those seen in Hindi or Hungarian? If we all have the parts needed to derive and parse a comparative correlative, the very same parts needed to derive and parse a correlative, then why are there no correlatives in English that walk, talk, and act like correlatives?

With respect to first language acquisition of comparative correlatives, den Dikken (2005) argues that the most difficult part will be for the child to learn the quirky lexical

items of the expression and what role they play in the expressions. The English-learning child encountering the correlative in (134) will not hypothesize that all correlatives are available in English, but rather will only hypothesize that this type exists. But this seems backwards. By having the ability to parse the correlative, the child needed to already have the knowledge of correlatives broadly speaking. That is, the child already needed to have learned how to derive the correlative structure. If the child could derive this structure, and must derive this structure every time a correlative of any kind is parsed or produced, why wouldn't the child use the generative power her grammar possesses and derive more typical correlatives? Within theories of generative syntax, one assumption must be made: speakers produce utterances that they have never encountered before. Further, we could extend this to say that the child produces utterances that they have never encountered before. It also is arguable that if the primary linguistic data (PLD) includes more complex versions of types of expressions, the child will be able to generalize that the less complex versions are available in their language. For instance, imagine a child only heard object relative clauses; she would likely conclude that subject relative clauses are part of the target language. In the same way, imagine a child only heard comparative correlatives; wouldn't she, if comparative correlatives really are just a kind of correlative built from the same syntactic structure that correlatives are built from, conclude that correlatives are part of the target language?

5.3 Important points to note

There are several contributions den Dikken's (2005) paper provides, both empirical data and theoretical considerations. I note the ones here that are directly relevant to the analysis I propose in chapter III.

- Most notably, this paper introduces correlatives as relevant data to consider in what comparative correlatives are similar to. Comparative correlatives are not weird or *sui generis*; they are like another well-established kind of structure that is seen cross-linguistically. Following directly from this, den Dikken (2005) gives a principled account for why comparative correlatives must have two and only two clauses.
- Attributed to Beck (1997), he addresses the observation that the comparative in the comparative correlative cannot take a measure phrase or a complement *than*-phrase. Simply put, the structure he proposes, which is imposed upon the languages he deals with, provides no structural position for such a complement *than*-clause to hold.
- The paper contributes more data from several languages in which comparative correlatives had previously not documented, including Hungarian which has a productive correlative strategy for relativization. He also provides a look at historical data by examining Old and Archaic English.
- English's obligatory *the* is a Deg⁰, the first syntactic proposal that considers this morpheme is something other than the definite determiner.

6. Compositional Semantics

This section addresses the semantics of comparative correlatives and two proposals which account for the meaning compositionally. Though it is not directly addressed in either of the two proposals reviewed here, accounting for the meaning of comparative correlatives plays a central role in the disagreement over how the data is best analyzed (c.f., Culicover & Jackendoff, 1999). In light of this, this section is not intended

to cover the entire spectrum of semantic proposals for comparative correlatives, but those that are compositional in nature, and that assume the semantic interpretation of linguistic expressions is derived from the same hierarchical tree that the syntax provides. Both of the authors (Beck, 1997; Lin, 2007) do not provide an explicit proposal for syntax, but implicitly assume that the derivational tree proposed for the semantic derivation must comport with the syntactic behavior of the expressions.

6.1 Beck (1997)

6.1.1 Summary of the paper

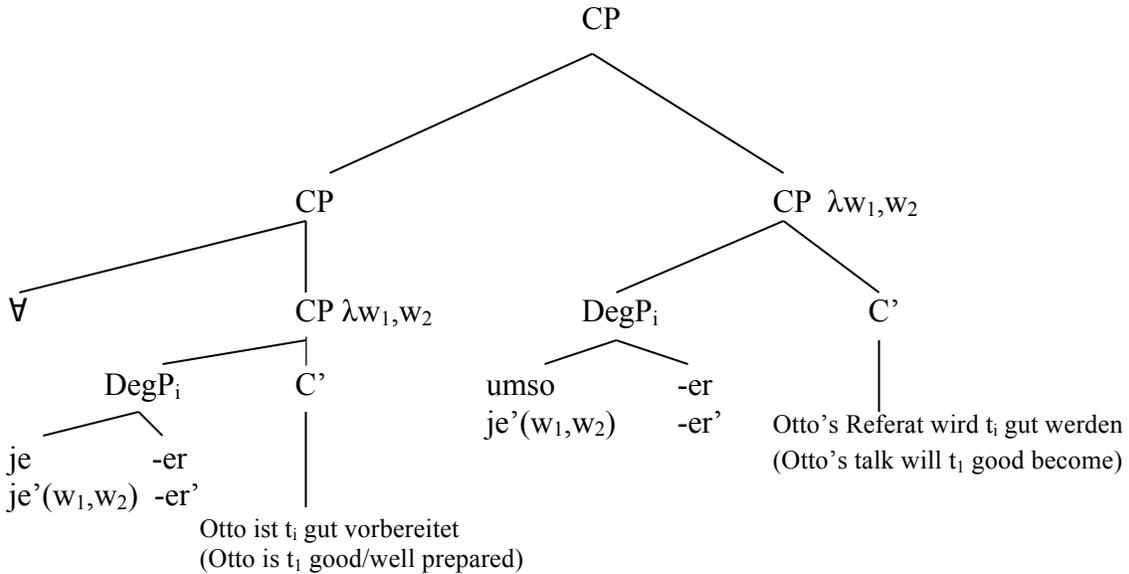
Beginning with McCawley's (1988) and Fillmore's (1987) observation that comparative correlatives are a type of conditional, Beck (1997) proposes an analysis of the data that exploits what is already proposed for the semantics of conditionals and for comparatives. She uses German as the primary data, noting other languages when they are suitable to the proposal. We have already seen comparative correlatives in German in §2.2, in which McCawley's (1988) paper was reviewed. As the reader will recall, he also noted that the data share syntactic and semantic characteristics with both standard comparatives and standard conditionals. In a sense then, Beck's (1997) proposal extends McCawley's conceptualization by marrying the semantic formalisms of comparatives and conditionals.

However, as generally observed by many linguists investigating the data, the formalization of the semantic interpretation of comparative correlatives is not merely the union of conditionals and comparatives. Beck (1997) relies upon the German morphemes *je* and *desto/umso*, which she takes to have identical semantic contribution, to play an important role in bringing together conditionals and comparatives. Using the comparative

correlative from German given in (135), Beck assigns the structure in (136) for the LF of the expression. The interpretation of this structure is in (137), where d = degree, and w = possible world.

- (135) *je besser Otto vorbereitet ist, desto besser wird sein Referat werden*
the better Otto prepared is the better will his talk become
 “The better Otto is prepared, the better his talk will be.”
 Beck (1997)’s example (15)

- (136) $\forall(\lambda w_1, w_2 [je'(w_1, w_2)(-er')(\lambda w \lambda d [well(d, \lambda x [prepared_w(x)])(Otto)])])$
 $(\lambda w_1, w_2 [je'(w_1, w_2)(-er')(\lambda w \lambda d [good_w(d, Otto's_talk)])])$



- (137) $\forall(\lambda w_1, w_2 [\exists d(d > 0 \ \& \ \text{the max } d_1 [[well(d_1, \lambda x [prepared_{w_1}(x)])(Otto)]] =$
 $d + \text{the max } d_2 [well(d_2, \lambda x [prepared_{w_2}(x)])(Otto)]]$

$$\Rightarrow [[\exists d(d > 0 \ \& \ \text{the max } d_1 [good_{w_1}(d_1, Otto's_talk)] =$$
 $d + \text{the max } d_2 [good_{w_2}(d_2, Otto's_talk)]]]$

To remind the reader, German comparative correlatives consist of two clauses, the first subordinate and beginning with *je*, and the second the main clause beginning with *desto* or *umso* (138). Though Beck’s proposal is based on German data, she states that English’s *the* is synonymous with German’s *je* and *desto/umso* in its semantic contribution; in short, English’s *the* and German’s *je/desto/umso* are assumed to be instances of the same thing semantically. They are operators which take three semantic

arguments, create a pair of difference arguments for the comparative morpheme to take as its own arguments, and hold the syntactic position of a measure phrase, thus precluding any comparative correlative from having a measure phrase modifying the comparative as occurs in standard comparatives.

- (138) *je länger du in Deutschland wohnst, desto besser wirst du Deutsch sprechen*
the longer you in Germany live the better will you German speak
 ‘The longer you live in Germany, the better you will speak German.’

Beck begins her analysis by noting that the intuitive interpretation of a comparative correlative is much like that of a conditional, with the addition of an implicit comparison. Given this, the structure for a comparative correlative should be like that of a conditional. Beck proposes a tripartite correlative structure (von Fintel, 1994), classifying the first clause as the restrictor and the second as the clause that has nuclear scope. This leaves the question of what the quantifier of this tripartite correlative structure is. Beck notes that the semantic interpretation of comparative correlatives intuitively involves universal quantification over pairs of possible worlds, times, or individuals (139), (140) and (141) respectively (Beck’s (15)-(17)). Since this universal quantification must be occurring, a universal quantifier (presumably covert and default) must be in the structure and bind the pair of variables. This leads us to donkey anaphora and Heim’s (1982) default universal quantification.

- (139) *je besser Otto vorbereitet ist, desto besser wird sein Referat werden*
the better Otto prepared is the better will his talk become
 “The better Otto is prepared, the better his talk will be.”

- (140) *Je schleimiger ein Anwalt aussieht desto erfolgreicher ist er*
The slimier an Attorney looks the successful-er is he
 “The slimier an attorney looks, the more successful he is.”

- (141) Uli war umso müder, je heißer es war³¹
Uli was the tired-er the hotter it was
 “The hotter it was, the more tired Uli was.”

The classic problem in dealing with donkey anaphora in conditionals (e.g., *if a farmer loves a pig, he feeds it*) is that the indefinite DPs *a farmer* and *a pig* in the *if*-clause are coindexed and coreferential with the deictic pronouns *he* and *it* respectively, yet no c-command relationship exists between these two variables in order to ‘link’ their semantics. Heim’s (1982) proposal for how to deal with this, both in conditionals and in relative clause donkey sentences (e.g., *every farmer who owns a donkey beats it*), is that a covert obligatory universal quantifier c-commands and binds both the indefinite and the pronoun, rendering their licit coindexation (syntax) and coreference (semantics). This quantifier can be overridden by an overt adverb of quantification, as in (142).

- (142) If a farmer owns a donkey, he usually beats it

Beck does not note that actual donkey anaphora occurs in comparative correlatives (c.f., example (87)b in §3.2.1), but does make use of Heim’s default universal quantifier. In comparative correlatives, each clause contains a degree value, and they need to be linked with one another somehow in order to achieve the semantic interpretation that the expression has. Extending Heim’s proposal for a default universal quantifier in conditionals, Beck proposes that such a quantifier must exist in comparative correlatives in order to bind the two degree variables in the two clauses. We can see this clearly in the structure in (136) above along with the interpretation in (137). The

³¹ Note that this example is a German ICC, translated by Beck as a comparative correlative. A more accurate gloss might be more like “Uli was more tired, the hotter it was.” It is not important to the point made by Beck and summarized here, however. The point remains that in comparative correlatives both in German and English, universal quantification over pairs of individuals is possible.

universal quantifier adjoined to the lefthand CP is Beck's proposed default quantifier which binds the degree (*d*) variables in each DegP.

Both clauses of the comparative correlative contain a comparative morpheme. This is true in German and English, and so accordingly Beck proposes that the semantics of comparative correlatives include the semantics of comparatives. Her proposal for the semantics of comparatives is that of maximal degree analysis. A comparative (*-er* in German) can take three arguments: the first argument of comparison, a difference degree, and a second argument of comparison. These three arguments are all present in (143) below. The first argument of comparison is *the tree is tall*; the difference degree argument is *3 meters*; the second argument of comparison is *the fence is tall*.

(143) The tree is 3 meters taller than the fence

Most importantly in considering comparative correlatives, Beck notes that the comparative cannot take a difference degree or a second *than*-clause argument of comparison, as in (144) and (145). In addition to (144), Beck provides other examples demonstrating that presence of an overt *than*-clause in the second clause alone and in both clauses are also unacceptable. Though the presence of a difference degree argument is optional in standard comparatives, the unacceptability of such an argument in comparative correlatives is curious.

(144) *je müder Otto ist als Hans, desto aggressiver ist er
the tired-er Otto is than Hans, the aggressive-er is he
"The more tired Otto is than Hans, the more aggressive he is"

(145) *je (um) eine Stunde später es wurde, desto (um) drei Grad heißer wurde es
the by one hour later it got the by three degrees hotter got it
"The one hour later it got, the three degrees hotter it got."

There are two ways to tackle this inconsistency with the behavior of ‘garden variety’ comparatives. Either (i) the comparative in comparative correlatives has a different kind of semantics than that of a standard comparative, or (ii) the arguments of the comparative in a comparative correlative are not as readily recognized as they are in a standard comparative. Beck opts for the latter approach. The question then is, what are two arguments of comparison, and why does the comparative not tolerate a difference degree argument? This question leads us back to English’s obligatory *the* and German’s *je* and *desto/umso*, all of which Beck takes to be instances of the same head with identical semantics.

As we would expect, the comparative *-er* is a degree head, the specifier of which can host a constituent that functions as a measure phrase (or difference degree in Beck’s maximal semantics of comparatives). Under Beck’s analysis, this Spec,DegP in each clause of a comparative correlative is occupied by *je* or *desto/umso* (English “the”). It is not a measure phrase itself, but because it occupies this position, no difference degree argument can exist for the comparative in either clause. Beck proposes that this head is an operator³² which takes three arguments of its own, one of which is a pair of arguments of comparison for the comparative morpheme to take as its own arguments. The pair of arguments of comparison are derived from the base-generated portion of the clause, that which follows the comparative *-er*. The maximal analysis of comparatives provides a formalism of standard comparatives in which the first argument of comparison is given a maximal value and the second argument of comparison is said to be less than this

³² For ease of exposition, I henceforth refer to this operator as simply a *the*-operator.

maximum. For instance, the maximal analysis of the comparative in (146) is given as a formulation in (147) and as prose in (148).

(146) The tree is taller than the fence

(147) The $\max d_1$ [tall (d_1 , tree)] > the $\max d_2$ [tall (d_2 , fence)]

(148) The maximal degree 1 to which the tree is tall to that degree 1 is greater than the maximal degree 2 to which the fence is tall to that degree 2.

In a comparative correlative, the two arguments that the *the*-operator creates in each clause are inherently related to what kind of variables are being quantified, possible worlds, times, or individuals. For instance, in (149) possible worlds are being compared. The paraphrase of the semantics of (149) would be something like “for any two worlds w_1 and w_2 , if Otto is more prepared in w_1 than in w_2 [the degree to which Otto is prepared in w_1 is greater than the degree he is prepared in w_2], then Otto's talk is better in w_1 than in w_2 [the degree to which Otto's talk is good in w_1 is greater than the degree to which it is good in w_2].” For the two clauses in (149) then, the *the*-operator in the first clause would create the pair of arguments $\max d_{w_1}$ [prepared (d_{w_1} , Otto)] and $\max d_{w_2}$ [prepared (d_{w_2} , Otto)], and the *the*-operator in the second clause would create the pair of arguments $\max d_{w_1}$ [good (d_{w_1} , Otto's talk)] and $\max d_{w_2}$ [good (d_{w_2} , Otto's talk)].

(149) The better prepared Otto is, the better his talk will be

The other two arguments of the *the*-operator are the interpretation of the rest of the clause following the compared constituent and the comparative morpheme *-er*. Once the *the*-operator has created the pair of comparison arguments to supply the comparative *-er* with its necessary semantic arguments, the comparative is able to satisfy its semantic combinatorics as it would in a standard comparative.

Before leaving this paper, we pause briefly to review the evidence provided for treating *je* and *desto/umso* as semantically identical. There are acceptable comparative

correlatives in German where both clauses are introduced by *umso* (150), as well as there idiomatic expressions in which both clauses begin with *je* (151). Further, in Dutch both clauses can begin with *hoe* (“how”) and of course in English, both clauses must begin with *the*.

(150) *umso länger du wartest, umso schlimmer wird es*
the longer you wait the worse becomes it
 “The longer you wait, the worse it becomes.”

(151) *je länger, je lieber*
the longer the better
 “The longer, the better”

In a footnote (fn. 14, p. 254), Beck suggests that “in Mandarin Chinese, the marker that presumably would do the same job is *yuè*, which also occurs twice.” Aside from the data that are discussed by McCawley (1988), this is the only mention of Mandarin or the morpheme *yuè* in Beck’s analysis. It is from this departure point that Lin (2007) (reviewed in the subsection §6.2) begins her analysis of comparative correlatives in Mandarin Chinese.

6.1.2 Commentary

It is an interesting coincidence that Beck (1997) makes use of Heim’s (1982) universal quantifier since we have seen evidence that actual donkey anaphora can occur in comparative correlative. We saw earlier in §3.2.1 that donkey anaphora can occur in comparative correlatives, just as it does in conditionals. I repeat examples (87)a-b below as (152)a-b to remind the reader.

(152) a. If [a farmer]₁ loves [a pig]₂, he₁ feeds it₂
 b. The more [a farmer]₁ loves [a pig]₂, the more he₁ feeds it₂

Just as is observed in familiar cases of donkey anaphora (142), in comparative correlatives Heim's universal quantifier can be overridden by an overt adverb of quantification, as in (153).

(153) The more a farmer loves a pig, the more he usually feeds it

In order to account for cases in which actual donkey anaphora occurs in comparative correlatives, a second universal quantifier would need to be adjoined to this same position. The two quantifiers would need to be distinguishable from one another, as they serve different purposes in the computation of the interpretation. I see no reason why it would matter which default quantifier should be higher in the structure.

Beck's use of Heim's default universal quantifier in comparative correlatives raises an interesting question for how to deal with comparative correlatives that involve actual donkey anaphora, as in (152)b. Is Heim's default universal quantifier capable of binding two degree variables (the 'CC' variables), while also binding two indefinites (the 'donkey' indefinites)? The other alternative would be that two universal quantifiers exist in the structure, one for degree variables and one for indefinites. I leave such a question for future investigation.

There is one last point that I will introduce briefly here and then return to in more detail in chapter III. Beck's (1997) places a good bit of the workload of the semantics on the *the*-operator, corresponding to the German morphemes *je/desto/umso*. In my analysis to be given in chapter III, *the* is a functional head in the CP domain and not the kind of functional head that one would normally think of as having a semantic role as an operator. Further, this categorization of *the* places it in a different structural relationship with other elements in a clause than Beck's *the*-operator does. However, I do propose in

chapter III that a phonetically-null quantifier sits as the specifier of the comparative morpheme, exactly in the location where Beck's *the*-operator is proposed to be structurally. It is a small step from this proposal to say that such a null quantifier, and not English's *the* is, in fact, Beck's *the*-operator.

6.1.3 Important points to note

The most important contribution of this paper towards the goals of this thesis is to propose a compositional semantics for the interpretation of comparative correlatives. Beyond this, the paper provides a more in-depth look at what the characteristics of comparative correlatives are in German, far beyond what was presented in McCawley (1988). Lastly, Beck (1997) gives a very specific semantic treatment to *je/desto* which she takes to contribute the identical semantics that *the* does in English comparative correlatives. Her treatment of *the* deviates significantly from the notion that *the* is the definite determiner and instead assigns it the semantic role of an operator.

6.2 Lin (2007)

6.2.1 Summary of the paper

Lin (2007) examines comparative correlatives in Mandarin, which differs in important ways from other languages that had been previously discussed in the literature. After briefly reviewing Beck's (1997) analysis for German comparative correlatives, Lin (2007) addresses the ramifications for the proposal if extended to Mandarin as suggested. *Yuè*, which is normally understood as having a comparative semantic interpretation, would instead be an operator that creates pairs of arguments of comparison for a different comparative morpheme. This necessitates that the comparative morpheme in Mandarin comparative correlatives would be null. To propose a null element is not unprecedented,

but it would be unusual given that an overt morpheme exists in the expression which normally has the semantics of the null element being proposed.

By reviewing the semantics and syntactic behavior of a range of degree morphemes (*bǐjiào* = compare, *gèng* = more, *hěn* = very³³), Lin argues that *yuè* is a degree morpheme, evidenced by the fact that it cannot co-occur with another degree morpheme, a generalization found across Mandarin sentences. This evidence casts further doubt on Beck's suggestion that *yuè* is not a degree morpheme, but rather a semantic operator that creates arguments for a null degree morpheme. As a last argument that *yuè* is not an instance of Beck's *the*-operator, Lin demonstrates that in Mandarin, unlike German and English, *yuè* can occur with an overt object of comparison (154). This means that Beck's extension of her analysis of *je/desto/umso* to Mandarin must be incorrect. Under Beck's analysis, *je/desto/umso* (and by extension, *yuè*) in each clause creates two arguments of comparison for the degree morpheme in that same clause. In Mandarin, if an overt object of comparison can occur in either clause of a comparative correlative, it cannot be the case that one of *yuè*'s semantic functions is to create two arguments of comparison for a null degree morpheme.

(154) nǐ yuè bǐ tā kuàilè tā jiù yuè tongkǔ
you more compare he happy he then more painful
lit. "The happier you are than he, the more painful he is."

In her proposal for the semantics of Mandarin comparative correlatives, Lin (2007) makes several theoretical assumptions. First, the similarities between conditionals and comparative correlatives in Chinese (and English as observed by Beck) indicate that

³³ Though this morpheme is given the gloss "very" here and in Lin's examples in the paper, Lin presents evidence that *hěn* is an overt instantiation of Kennedy's (2005) *pos*, which he proposes is phonologically null across all languages.

both types of expressions have a tripartite structure at LF, consisting of a quantifier which is obligatorily universal if no overt quantifier is present, a first clause which is mapped to the restriction of the quantifier, and a main clause which receives nuclear scope. Related to this, the two *yuè*'s that appear in each clause are adjoined to the restriction and nuclear scope at LF, and the optionally overt morpheme *jiù*, usually translated as “then,” is also adjoined to the second clause at LF. Lastly, adjectives have an additional degree argument and verbs have an additional degree or quantity argument. Given these assumptions, the proposal is as follows. *Yuè* is a degree adverb that minimally takes as its argument a relation between a degree and situation and a second degree and situation; *yuè* compares the two and gives back a corresponding relation between them. The morpheme *jiù*, normally associated with some kind of causation, is analyzed as giving rise to causation between the degrees and situations of the first clause and the degrees and situations of the second clause by means of pragmatic implicature.

Given these assumptions, the semantic interpretation of a comparative correlative, as opposed to other types of tripartite structures like conditionals or comparatives, is largely derived from the degree adverb *yuè*. The degree adverb takes the implicit arguments of situation and degree available and establishes a comparison relation between them. To see this in detail, take Lin's example (1) and its semantic formalism of the first clause (63)c, here as (155) and (156). The variable *g* represents a degree argument and the variable *s* represents a situation argument. The variable *P* indicates that the first clause will receive the interpretation of the restrictor, as in *if P, then Q*, once the causative pragmatics come into play.

(155) *nǐ yuè shēngqì, tā (jiù) yuè gāoxìng*
you more angry he JIU more happy
 ‘The angrier you are, the happier he is.’

(156) $\llbracket_{CP} yuè nǐ shēngqì \rrbracket$
 $= \lambda P_{\langle d, \langle s, t \rangle \rangle} \lambda g_1 \lambda g_2 \lambda s_1 \lambda s_2 [P(g_1)(s_1) \wedge P(g_2)(s_2) \wedge g_2 > g_1] (\lambda g \lambda s. \text{angry}'(\text{you}')(g)(s))$
 $= \lambda g_1 \lambda g_2 \lambda s_1 \lambda s_2 [\text{angry}'(\text{you}')(g_1)(s_1) \wedge \text{angry}'(\text{you}')(g_2)(s_2) \wedge g_2 > g_1]$

The semantics for the first clause read as, for every g_1 , g_2 , s_1 , and s_2 , such that you are angry in s_1 to degree g_1 , and you are angry in s_2 to degree g_2 , the degree to which you are angry in s_2 is greater than the degree to which you are angry in s_1 . The value of degree g in situation s_1 is assumed to be the minimal value of that degree for that predicate. The degree g in another situation s necessarily must be greater than the minimal value, thus making part of the formulation that the predicate must be gradable. The second clause which receives nuclear scope is interpreted in a similar way, but the degrees and situations are assigned different indexes, as in (157), Lin’s (63)d.

(157) $\llbracket_{CP} yuè tā gāoxìng \rrbracket$
 $= \lambda g_3 \lambda g_4 \lambda s_3 \lambda s_4 [\text{happy}'(\text{he}')(g_3)(s_3) \wedge \text{happy}'(\text{he}')(g_4)(s_4) \wedge g_4 > g_3]$

Note that in both the first and second clause, though *yuè* is heard after the subject (155), in each clause *yuè* has raised at LF to take scope over the entire clause, as in (156) and (157). What remains to accomplish in the formalism of a comparative correlative is to link the meaning of the two clauses. This is accomplished by the morpheme *jiù*. Lin also assumes that a covert universal quantifier exists since the comparative correlative has a tripartite structure.

(158) $\llbracket \forall yuè nǐ shēngqì jiù yuè tā gāoxìng \rrbracket$
 $= \forall g_1 g_2 s_1 s_2 [\text{angry}'(\text{you}')(g_1)(s_1) \wedge \text{angry}'(\text{you}')(g_2)(s_2) \wedge g_2 > g_1]$
 $\Rightarrow \exists g_3 g_4 s_3 s_4 [s_1 \leq s_3 \wedge s_2 \leq s_4 \wedge R(\langle g_1 s_1 \rangle, \langle g_3 s_3 \rangle) \wedge R(\langle g_2 s_2 \rangle, \langle g_4 s_4 \rangle) \wedge \text{happy}'(\text{he}')(g_3)(s_3) \wedge \text{happy}'(\text{he}')(g_4)(s_4) \wedge g_4 > g_3]$

The universal quantifier has added the interpretation “for every” to the entire expression; the causative *jiù* adds a way for the pairs of values of g and s to have a

relationship to one another. The final interpretation of a comparative correlative, given Lin's formalism in (158) is, "for every g_1, g_2, s_1, s_2 such that you are g_1 -degree angry in s_1 and g_2 -degree angry in s_2 , and g_2 is greater than g_1 , there exists a g_3, g_4, s_3, s_4 such that s_3 is an extended situation of s_1 and s_4 is an extended situation of s_2 and he is g_3 -degree happy in s_3 and g_4 -degree happy in s_4 and g_4 is greater than g_3 . Moreover, g_1 in s_1 has a R relation to g_3 in s_3 and g_2 in s_2 has an R relation to g_4 in s_4 ," (Lin 207:25). Note that the semantics do not include causation, but only an 'R relation' between degrees in the two clauses. The interpretation of causation is derived via pragmatic implicature from the semantic meaning of the R relation provided by *jiù*.

One of the assumptions Lin (2007) makes for this proposal is that adjectives must have an obligatory degree argument and verbs must have an obligatory degree or quantity argument. As we just saw in the above semantic derivation, degrees paired with situations and the comparison of degree-situation pairs are ineliminable from the comparative correlative if this proposal is correct. The semantics for the comparative correlative we just saw take this degree argument from the adjectives *angry* and *happy*; it is uncontroversial that adjectives obligatorily have degree arguments (see, for example, Kennedy 1995, 1997). But why would verbs need to have a degree or quantity argument? As the reader will recall, Beck (1997) notes that comparative correlatives allow a variety of semantic types to be compared – possible worlds, times, or individuals. If the element of degree is introduced as part of the semantic interpretation of Mandarin's *yuè*, possible worlds, times, and individuals all need to have a degree argument. Consider (159). From where does the degree argument arise? In order for Lin's proposed semantics for *yuè* to

come about, the verbs *like* and *be* in clause one and two respectively must contain a degree or quantity argument.

(159) The more we like to eat our vegetables, the more our mothers will be pleased

Given this assumption, a sentence like (160) has an interpretation like, ‘we are in a situation where we like to eat our vegetables to a certain degree.’

(160) We like to eat our vegetables

Extending this proposal in a similar fashion, Lin proposes that comparison of time like (161) will necessarily include time variables (i.e., *t*), and that comparison of individuals like (162) will necessarily include individual variables (i.e., *x*).

(161) The hotter the weather is, the more uncomfortable I feel

(162) The bigger an apple is, the more delicious it is

6.2.2 Commentary

Taking all this together, the degree adverb *yuè* and the causative morpheme *jiù* do almost all the work of giving comparative correlatives the interpretation they have in Mandarin Chinese. Though Beck (1997) argues that *yuè* is an instance of the operator represented by *the* in English and *je/desto/umso* in German, Lin demonstrates that this cannot be the case. Further, the operator needed in English and German in order to explain the ban on overt arguments of comparison is not needed for Mandarin inasmuch as Mandarin allows overt arguments of comparison. This is all well and good for Mandarin, but where does this leave English’s *the*, if it is no longer a degree head? Lin proposes that English’s *the* is a specifier of the degree head *-er/more/less* and that *the* is syntactically a DP (determiner phrase), bound by the subject of the clause and semantically a copy of the subject. As such, *the* in English comparative correlatives denotes the same object as the overt subject in the clause it appears in.

Taken together, the two formal analyses given by Beck (1997) and Lin (2007) lay out in detail the derivation or the semantic interpretation of comparative correlatives in a specific language, and then extend that proposal to English, given the observable similarities and contrasts each language has with English. The two proposals are not compatible; in other words, we cannot simply take the formal semantics of *je/desto/umso* ('the') given by Beck and the formal semantics of *jiù* ('then') given by Lin and combine them together in one mega-semantics for English. Further, there is some question as to whether either proposal lends to an analysis of *the* that correctly characterizes its syntactic behaviors. What I sketch here is a brief consideration of what would be prudent to include and what would be reasonable to exclude from each of these proposals as far as English is concerned. I also include some brief remarks of what the semantic of *the* in English could include given what we will discover of its properties in the next chapter of this thesis.

Beck (1997) extends the use of Heim's default universal quantifier to comparative correlatives and proposes that this quantifier is responsible for linking the degrees in each clause together. As noted in §6.1.1 however, Beck does not note that comparative correlatives evidence actual donkey anaphora, which would constitute another function of this universal quantifier. Do we conclude that there are two default universal quantifiers? Or do we conclude that the single default quantifier binds and coindexes indefinites as well as binds and correlates degree values? If Lin's (2007) proposal for the morpheme *jiù* is extended to English, we do not need to wrestle with this question. The default universal quantifier performs the same function in comparative correlatives that it does in

conditionals and relative clause donkey anaphora cases: it binds indefinite DPs. The correlation between the values in the two clauses is derived from the semantics of *jiù*.

It is integral to Lin's (2007) proposal that the interpretation of causation which is seemingly inherent to the comparative correlative arises as a by-product of the pragmatics, and not strictly from the formal compositional semantics. The morpheme in Mandarin responsible for this, *jiù*, has a counterpart in English comparative correlatives, *then*. In some dialects of English, the conditional marker *then* appears at the start of the second clause, as in (163)³⁴. In Mandarin, *jiù* is not obligatory, leading Lin (2007) to propose that this morpheme is always part of the comparative correlative, whether it is phonetically realized or not. In English, given that *then* can sometimes occur, we should consider whether the semantics of this morpheme are as Lin proposes for Mandarin.

(163) The darker the coffee beans (are) **then** the less the caffeine (there is)

Remember that the interpretation of causation in comparative correlatives is derived via pragmatic implicature from the semantic meaning of *jiù*. This interpretation via pragmatics is appealing for reasons independent of those given by Lin (2007). The truth of a comparative correlative holds even when the pairing of degree values do not correspond strictly in a one-to-one fashion. For example, consider the comparative correlative in (164) and the corresponding values for the time Bill arrives and the amount of work he completes in the table in (165).

³⁴ This example was found using the Linguist's Search Engine, and discussion of evidence for the acceptability of overt *then* in comparative correlatives is included in Resnik, Elkiss, Lau & Taylor (2005) as part of this corpus search.

(164) The earlier Bill arrives at his office, the more work he completes

(165)

Work day	Time of arrival	Amount of work completed
1	10:00 am	2 reports
2	9:30 am	5 reports
3	9:00 am	7 reports
4	8:30 am	6 reports
5	8:00 am	9 reports
6	7:30 am	13 reports

As Beck (1997) observes, the increments of time and the amount of work completed need not correspond as a linear function. But beyond this, the amount of work completed does not strictly increase as the earliness of Bill's time of arrival increases. On day 4, there is an exception, where Bill's productivity actually decreases relative to the other work days. If the correlation between the values in the two clauses is derived strictly from the semantics, we would expect such an exception to render the truth value of (164) to be false in this condition. Yet the intuition is that the comparative correlative is in fact true in this condition. This intuition strengthens with the number of work days that conform to the generalization versus those that do not. For instance, if there were 100 work days in the table and it was still the case that work day 4 was the only exception to the correlation, the judgment of the truth value of (164) in this condition would be only more certainly true. If the causation interpretation between the first clause and the second is derived from the strict semantics, it is not straightforwardly clear how this exception would be accounted for.³⁵ However, if the correlation is derived from a semantic relation, and the causation from pragmatic implicature, a possibility of how to handle this problem opens up. If we take the interpretation of correlation between the two clauses to be

³⁵ One possible solution would be that the implicit operator here is something akin to "usually" or "generally" rather than universal "always."

derived from the semantics of an optional *then*, this would lead us to believe that the semantics Lin proposes for *jiù* should be extended to English instead of relying upon *the* to provide the semantics that derive the interpretation of correlation.

It is unlikely, as Lin (2007) proposes, that *the* as a specifier of the degree head *-er/more/less* is an instantiation of the subject of the clause with the syntactic label DP. In the position she proposes, this semantically-interpreted subject and syntactically labeled DP would be in the position normally occupied by a measure phrase of a degree head. While it is true that English comparative correlatives do not allow a measure phrase to modify the degree head in either clause, it is unclear how the semantics of this position would be achieved as proposed in this formalism. Most importantly, it stands to reason that the individual clauses of a comparative correlative neither need to nor should they permit a resumptive subject pronoun in English. Given this, the semantics of English's *the* are still left as a problem to be solved.

The quandary we are left with is what to do with the semantics of *the*. By considering the two formal semantic proposals, I have suggested that the semantics proposed by Lin (2007) for Mandarin can be extended to English, given that there is no morpheme in Mandarin that corresponds to English's *the*. By suggesting this adoption of Lin's proposal for English, the formalism given by Beck (1997) for *the* now would constitute a redundancy, in that *the* is an operator that creates arguments for comparison which Lin assumes are inherent to the semantics of adjectives and verbs.

In the following chapter, after extensively examining the syntactic behaviors and properties of English's *the*, it is concluded that *the* is a complementizer which sits in the expanded CP-domain (ala Rizzi, 1997) as the head of each clause, a ForceP. The

obligatory presence of *the* at the start of each clause appears to be reflex of A'-movement, appearing only in comparative correlatives where the subordinate clause is first linearly. When the subordinate clause is second, the presence of *the* is not allowed (see (166) and (167)). The contrast between the subordinate clause (underlined) in (166) and (167) is that the compared phrase *less recess time* has moved to the front of the clause, and the word *the* now obligatorily appears before the phrase.

(166) **The** more the boys talk, **the** less recess time they will have

(167) The boys will have less recess time, **the** more they talk

I suggest here that the morpheme *the* obligatorily takes a functional phrase as its complement, the head of which triggers the overt syntactic movement of the compared phrase in order to check semantic features which it holds. What these semantic features are, I leave for further work. I speculate that the morpheme *the* in comparative correlatives may have very similar semantic contribution to the definite determiner *the*. If so, this would constitute an instance of semantics of a single item holding when the syntax of an expression demands that an item have a specific syntactic category. The semantics of the definite determiner *the* have been proposed to include features of uniqueness, definiteness, and maximality; these features may prove essential to successfully create the arguments of comparison which is required under either Beck's (1997) or Lin's (2007) proposal. However, both clauses of the comparative correlative are not DPs; they are CPs. The complementizer head needed for the syntactic structure to be derived as we see in English is, if this suggestion is borne out, a complementizer that holds the semantic features of the definite determiner. The semantic component of the grammar is able to use a lexical item independent of its syntactic category to derive the interpretation of an entire expression. In the same way, the syntactic component of the

grammar is able to derive a syntactic structure provided all LF uninterpretable features are eliminated from the syntactic object by the time it reaches the C-I interface; as long as the syntactic category that each head has allows them to be combined in a principled and predictable way, the semantics of those particular heads is left to the C-I interface to render semantic interpretation.

6.2.3 Important points to note

Like what I highlighted in my review of Beck (1997) in the previous subsection, the most important contribution of Lin (2007) for my purposes is that it gives a compositional semantics to comparative correlatives that addresses the specific contribution of individual heads and how they combine to capture the semantic interpretation of the entire expression. The paper also gives substantially more data of comparative correlatives and related data in Mandarin than McCawley (1988) presented. Further, Lin provides a way for the intuitive non-strict interpretation of correlation to be achieved through pragmatic implicature.

7. Summary of the empirical data

This chapter contains a large amount of diverse data on comparative correlatives across several languages. Not all of it will be needed in order for me to propose a formal analysis in the next chapter. So before leaving this chapter, it will be useful to summarize the empirical data that is directly relevant to that analysis. The data in this section are reproduced from other sections of this chapter as annotated, and the facts are cited where appropriate.

- First and foremost, across languages, comparative correlatives consist of two clauses; the first is subordinate to the second. This generalization is supported

crosslinguistically by tag question data, verb mood and tense inflection data (Culicover & Jackendoff, 1999), and verb position in the two clauses in V2 languages like Dutch and German (McCawley, 1988; Culicover & Jackendoff, 1999; den Dikken, 2005).

(168)

- a. ✓ The more we eat, the angrier you get, don't you?
- b. * The more we eat, the angrier you get, don't we?

(169) It is imperative that/I demand that...

- a. ✓ ...the more John eats, the more he pay(s).
- b. *...the more John eat, the more he pay(s).

(73), (74) reproduced

(170) *je länger du in Deutschland wohnst, desto besser wirst du Deutsch sprechen*
the longer you in Germany live the better will you German speak
 'The longer you live in Germany, the better you will speak German.'

(32) reproduced

- In English, both clauses begin with a displaced comparative phrase preceded by the obligatory word *the*. The displaced comparative phrase is logically understood lower in the clause. The relationship between the comparative phrase in each clause and its gap site appears to be one of unbounded dependency (as per Chomsky, 1977) (McCawley, 1988).

(171) The kinder₁ [he thinks [you're going to be ___₁ to him]], the more trouble₂ [you can anticipate [that he'll feel like [giving you ___₂]]].

(172) John is smarter than [WH-OP₁ [he told Sue [that he thinks [that Bill is ___₁]]]

(20), (21) reproduced

- The comparative morpheme in English can modify a NP, AdjP, AdvP, PP or TP.

- | | | |
|-------|---|------|
| (173) | The more <u>apples</u> you eat... | NP |
| (174) | The <u>hungrier</u> the wolves are... | AdjP |
| (175) | The more <u>often</u> an Olympian works out... | AdvP |
| (176) | The less <u>in the parking spot</u> the car is... | PP |
| (177) | The less <u>Judy thinks about her novel</u> ... | TP |

- English comparative correlatives evidence the full range of comparative morphology, including suppletive forms such as *worse* and *better* (McCawley, 1988).

(178) The **more** you talk, the **less** likely I am to listen

(179) The longer the storm lasts, the **worse** the damage is

- In English, the comparative morpheme in either clause cannot take an overt argument of comparison. Additionally, the comparative morpheme in either clause cannot take an overt measure phrase (Beck, 1997). Both of these characteristics hold for German comparative correlatives as well (Beck, 1997).

(180) *je müder Otto ist als Hans, desto aggressiver ist er
the tired-er Otto is than Hans, the aggressive-er is he
 “The more tired Otto is than Hans, the more aggressive he is”

(181) *je (um) eine Stunde später es wurde, desto (um) drei Grad heißer
the by one hour later it got the by three degrees hotter
 wurde es
got it
 “The one hour later it got, the three degree hotter it got.”

(144) and (145) reproduced

- The word *that* can optionally appear after the comparative phrase in the first clause, and, to a much lesser extent, in the second clause (Fillmore, 1987; McCawley, 1988; Culicover & Jackendoff, 1999; Resnik, Elkiss, Lau & Taylor, 2005). If we assume this *that* is a complementizer, this characteristic is not found in comparative correlatives of any other languages investigated thus far.

(182) The more (that) you think about the problem, the easier (*that) it will be to solve
 (2) reproduced

- Various tests of syntactic relationship via binding (logophoricity and donkey anaphora) yield the result that the first clause and second clause of the comparative correlative have the same syntactic relationship of that of a sentence-initial *if*-clause and the main clause of a conditional – that is, the first clause is subordinate to the second. (Culicover & Jackendoff, 1999; Taylor, 2006) The new data regarding donkey anaphora (given in §3.2.1) are reproduced here.

- (183) a. If [a farmer]₁ loves [a pig]₂, he₁ feeds it₂
 b. The more [a farmer]₁ loves [a pig]₂, the more he₁ feeds it₂
 c. Because [a farmer]₁ loves [a pig]₂, he₁ feeds it₂
- (87) reproduced

- A'-movement out of either clause to the highest COMP position of the entire expression is possible in English. This is the case for relative clause formation, topicalization (Culicover & Jackendoff, 1999), and *wh*-question formation if the comparative correlative is embedded under another predicate.

(184) The sooner you solve this problem, the more easily you'll satisfy the folks up at corporate headquarters.

- (185) a. ✓ This is the sort of problem which₁ the sooner you solve __₁, the more easily you'll satisfy the folks up at corporate headquarters.
 b. ✓ The folks up at corporate headquarters are the sort of people who₁ the sooner you solve this problem, the more easily you'll satisfy __₁.

- (186) a. ✓ This problem₁, the sooner you solve __₁, the more easily you'll satisfy the folks up at corporate headquarters.
 b. ✓ The folks up at corporate headquarters₁, the sooner you solve this problem, the more easily you'll satisfy __₁ .

- (187) a. ✓ Which problem₁ do you think that the sooner Bill solves __₁, the more easily he'll satisfy the folks up at corporate headquarters
b. ? Who₁ do you think that the sooner that Bill solves this problem, the more easily he'll satisfy __₁ ?

(84), (85), (86), (89) reproduced

This kind of A'-movement out of each clause is also allowed in French (Abeillé, Borsley and Espinal, 2006), Dutch, and German (den Dikken, 2005).

8. Summary & Conclusion

This chapter has examined the previously proposed analyses of comparative correlatives. One goal was to collect the documented behaviors of the expression, as well as to further test these behaviors in order to refine the generalizations made about comparative correlatives. We have seen that the crosslinguistic data often time converge, such as the similarity between comparative correlatives and conditionals, or the oft-times found quantifiers corresponding to 'what/how.much' and 'that.much' in the first (subordinate) and second (main) clause respectively. We also have seen that the theoretical conclusion drawn from one set of data are sometimes confounded by an interfering factor, such as the preliminary generalization that future *will* cannot appear in the second clause (McCawley, 1988). We have also seen that the conclusions drawn from one set of empirical tests are sometimes contradicted by a second different test. This was the case for tests to determine the relationship between the two clauses. We assume that a clause that is interpreted as a subordinate clause is left-hanging (i.e., if the clause precedes the main clause linearly), and therefore such a clause must be an adjunct or specifier. As such, it is subject to the CED. The first clause is to the left of what we hypothesize the main clause to be, yet movement out of the first clause is possible, suggesting that this characterization is incorrect, despite ample evidence that the first

clause is subordinate to the second (i.e., tag questions, V2 word order, imperative mood, subjunctive mood in English). We saw this situation come about in at least two languages (English and French).

A bigger question raised by the literature review in this chapter was the role of phrasal and sentential constructions. Most of the syntactic analyses presented here explicitly state that phrasal and sentential constructions are necessary as primitives in the grammar as evidenced by the data set the comparative correlatives provide. Despite this bold assertion, only one of the proposals based on CxG assumptions is a formal proposal (Borsley 2003, 2004, Abeillé, Borsley & Espinal 2006); the others are largely descriptive data (Fillmore, 1987; McCawley, 1988) or openly stated to be preliminary sketches not intended as formal analyses (Culicover & Jackendoff, 1999). The only syntactic proposal included that assumed compositionality for syntactic and semantic derivation is that of den Dikken (2005), which rests in a somewhat uncomfortable position of explicitly stating that it is not a construction-grammar approach, yet relies upon the existence of a crosslinguistic correlative frame in order for the expression to be successfully acquired during first language acquisition.

The semantic proposals reviewed here (Beck, 1997; Lin, 2007) lead us to the conclusion that it is possible to achieve an accurate semantic interpretation of comparative correlatives without reliance upon phrasal and sentential constructions. While it is true that there is still work to be done in the formalism of English, it is clearly not the case that compositionality as a method of explanation for the meaning of the expression is as impotent as it has been characterized in the literature.

This leads us to the next chapter, the need for a formal analysis of comparative correlatives within a framework that does not assume primitives larger than the individual syntactic head. If, under this assumption, a syntactic analysis for the data can be achieved, and if we assume that the semantic analyses already proposed are well on their way to explaining a great deal of the meaning of the expressions, we will be led to conclude that these data do not stand as evidence for the necessary existence of phrasal and sentential constructions as grammatical primitives.

Chapter III Proposal for the Syntactic Analysis of Comparative Correlatives

1. Introduction

The goal of this chapter is straight-forward: to provide a well-grounded analysis of comparative correlatives that is strictly compositional and does not rely upon the existence of phrasal or sentential constructions of any kind. As was made clear in the literature review in the previous chapter, achieving this goal has been deemed impossible by those who adopt phrasal and sentential constructions as primitives within their theoretical framework. In this proposal, I assume the tenets of the Minimalist Program (Chomsky 1993, 1995a), along with relevant work that has been built upon those tenets. Most importantly to the issue of constructions and endocentricity is the principle of bare phrase structure (Chomsky, 1995b), which satisfies the criteria of virtual conceptual necessity within the system of Language.

To remind the reader, the description of comparative correlatives put forth in chapter I of this thesis is as follows:

- (1) Characteristics of comparative correlatives
 - a. A comparative correlative has a semantic interpretation that can be paraphrased as "the degree or amount of some quality, substance, or situation x is correlated in some way with the degree or amount of some quality, substance or situation y."
 - b. A comparative correlative consists of two clauses, the first of which behaves syntactically as subordinate to the second.
 - c. A comparative correlative exhibits some overt degree morphology or overt quantifier that scopes over degrees.
 - d. Crosslinguistically (though not found in all languages), it is not atypical to find non-canonical word order in each of the clauses of a comparative correlative.

A typical example in English is here:

- (2) The more apples you eat, the healthier you'll be

Not coincidentally, we will begin and end the proposal in this chapter considering the enigmatic lexical item from English comparative correlatives: *the* which begins each phrase.

1.1 Brief clarification of terminology

The proposal that I put forth in this chapter differs from most before it in many ways. Because of this, I have found it easier to present my ideas using unique terms for each part of the expression. For ease of exposition then, I will review what these terms are.

From chapter II, we saw use of the terms *compared phrase* and *comparative phrase*. *Compared phrase* refers to a constituent proposed to include all and only the degree morphology, everything it modifies, and English's word *the*. Using the comparative correlative in (2) for specific examples, *the more apples* and *the healthier* are the compared phrases in the first and second clause, respectively.

Comparative phrase refers only to the degree morphology and everything it modifies, but not English's *the*. Again, using (2) for specific examples, *more apples* and *healthier* are the comparative phrases in the first and second clause, respectively.

Introduced here in this chapter is the term *comparative constituent*. Like the last term, *comparative constituent* refers only to the degree morphology and everything it modifies, but not English's *the*. Though this descriptively refers to the same word string as the comparative phrase, I include in the meaning of this term that this word string constitutes a syntactic constituent.

2. Microstructure

2.1 The complementizer *the*

One of the most notable descriptive characteristics about comparative correlatives in English is that both clauses obligatorily begin with the lexical item *the*. At first glance, we'd guess it's an instance of the definite determiner. There are a few reasons to doubt this first intuition. It would be a gross understatement to say that the definite determiner is a high frequency lexical item. We are used to analyzing it as a functional head that needs a syntactic sister with which it reliably forms a nominal constituent. But note in the case of comparative correlatives, the word strings which follow *the* appear nowhere else in English, as seen in (3)-(5) below.

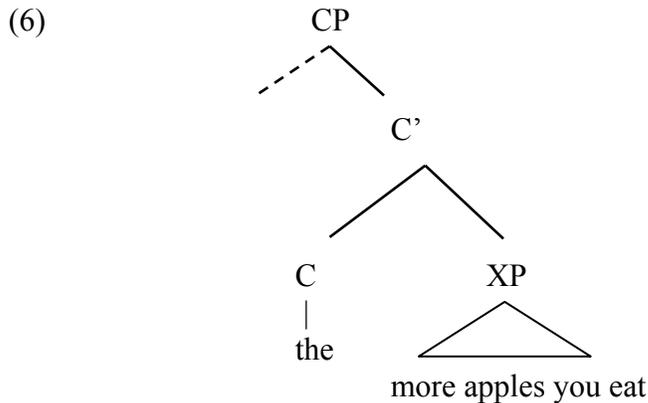
- (3) "the" + comparative + N ex. - *the more apples*
- (4) "the" + comparative + TP ex. - *the more I see you*
- (5) "the" + comparative + ADJ ex. - *the healthier*³⁶

This suggests that these kinds of word strings do not constitute a constituent. This simple finding should raise our suspicions about what *the* is. Unsurprisingly then, in two previous proposals of comparative correlatives, *the* is treated as something other than the definite determiner. Culicover & Jackendoff (1999) treat the comparative as a quantifier, and "the" as a determiner of that quantifier (following Bresnan 1973). Den Dikken (2005) proposes that each clause is a CP, a degree phrase sits in Spec,CP, and the head of the degree phrase is "the." Thus, "the" is a degree morpheme in that analysis.

In my proposal, *the* is a complementizer. It heads the highest CP in each clause and it c-commands everything else in the clause. This CP phrase can project a specifier

³⁶ Of course there are instances of "the" + comparative + ADJ + N = constituent, such as "the healthier boy." But note, these never occur in comparative correlatives in the relevant position under discussion here.

position which can be used for successive cyclic movement out of each clause. Using the first clause of (2) to demonstrate what this CP looks like, a sample structure is in (6) below.



In what follows in this section, I give four pieces of evidence that *the* in English comparative correlatives is a complementizer.

2.1.1 Subject-Aux inversion is barred in the root clause of comparative correlatives

As the heading of the subsection states, Subject-Aux Inversion (SAI), illustrated in examples (7)-(9) below in non-comparative correlative data, is not possible in English comparative correlatives. Example (7) is a *wh*-question, (8) is a yes/no question, and (9) is contrastive focus, all of which are environments where SAI canonically occurs in English. (10) is included as an example of an interrogative with the *wh*-phrase *how come* which crucially does NOT require or allow SAI.³⁷

- (7) Who did John ~~did~~ kiss ~~who~~
- (8) Did John kiss Joe?
- (9) Not only did John kiss Joe, but he kissed Mary, too.
- (10) a. How come John kissed Joe?
b. *How come did John kiss Joe?

³⁷ Thank you to Sam Epstein for bringing these data to my attention.

Under current minimalist theories, SAI in English involves T-to-C movement, where Tense cannot move to C if a phonologically-overt complementizer is present. If, in comparative correlatives, *the* is an overt complementizer, we would expect that SAI would result in an unacceptable expression. This prediction is borne out. For now, we won't worry about whether the first or the second linear clause is the root clause; T-to-C movement from either clause results in unacceptable expressions.

- (11) a. The more Mary gives gifts to Bill, the happier he is
 b. * Who₁ does the more Mary give gifts to t₁ , the happier he becomes?
 c. * Who₁ does the more Mary gives gifts to t₁ , the happier he become?
 d. ✓ Who₁ do you think that the more Mary gives gifts to t₁ , the happier he is?
- (12) a. The more pizza Romeo eats, the more disappointed Juliet becomes.
 b. * Does the more pizza Romeo eat, the more disappointed Juliet becomes?
 c. * Does the more pizza Romeo eats, the more disappointed Juliet become?
- (13) a. The more John changes, the more Joe likes him
 b. * Not only does the more John change, the more Joe likes him, but...
 c. * Not only does the more John changes, the more Joe like him, but...

In (11), we have the base sentence in (a), then a *wh*-expression A'-moves out of the first clause, and SAI is necessary. In (11)b and (11)c, we can see that the resulting expression is unacceptable, regardless of whether we try and construe the Tense to have originated in the first or second clause, respectively. It is not the case the *wh*-movement alone is the source of the violation; (11)d shows that if the entire comparative correlative is embedded under the verb *think*, the expression is acceptable. Similar to *wh*-question formation, T-to-C movement to form a yes/no question also results in an unacceptable expression, as seen in (12). And again, if T-to-C movement is necessary to form a sentence with contrastive focus, as in (13)b&c, the results are unacceptable.

To add one last example to show that this really is something about T-to-C movement, and not just about forming questions or *wh*-movement in general, we saw

above in example (10) that the *wh*-phrase *how come*, synonymous with “why,” can be fronted to form a *wh*-question, but it doesn’t allow SAI. Witness the expressions in (14):

- (14) a. The more things change, the more they stay the same
b. ✓ How come the more things change, the more they stay the same?

Indeed, unlike all other *wh*-phrases in English, *how come* can be used to form a *wh*-question in the comparative correlative without any extra embedding. This lends extra support to the assertion that T-to-C movement is disallowed in comparative correlatives because there is an phonologically-overt C, *the*, which blocks such movement.

2.1.2 *the* induces *that*-trace effects

If *the* which obligatorily appears at the start of both clauses of a comparative correlative is a complementizer, we would expect, all things being equal, that this complementizer would induce *that*-trace effects. The descriptive facts regarding *that*-trace effects are derived from examples like (15)-(21).

- (15) Bill said Mary likes Sue
(16) Who₁ did Bill say Mary likes t₁ ?
(17) Who₁ did Bill say t₁ likes Sue?
(18) Bill said that Mary likes Sue
(19) ✓ Who₁ did Bill say that Mary likes t₁ ?
(20) * Who₁ did Bill say that t₁ likes Sue?
(21) ?? Who₁ did Bill say that, for all intents and purposes, t₁ likes Sue?

If no overt complementizer is present in an expression, an embedded subject can A’-move higher in the expression (17) just as easily as an embedded object can (16).

However, if an overt complementizer exists, movement of an embedded object is still fine as in (19), but movement of an embedded subject results in an unacceptable expression as in (20). For whatever reason, inserting a phonologically “heavy” adverbial, like *for all intents and purposes*, improves the expression.

We saw in the last subsection (§2.1.1) that *wh*-extraction out of a comparative correlative requires embedding it under another predicate, so as to avoid the SAI problem. So in order to test for *that*-trace effects, we start first with the embedded comparative correlative in (22). *Wh*-movement of the object of each clause is fine as in (23)a&b, but *wh*-movement of the subject is not (24)a&b. And like in standard cases of *that*-trace effect, inserting a heavy adverbial between the complementizer *the* and the subject gap site improves the expression.

- (22) I said that **the** more Bill eats vegetables, **the** less Mary wants sweets
- (23) a. ✓ What_{t₁} did I say that **the** more Bill eats t₁, the less Mary wants sweets?
 b. ✓ What_{t₁} did I say that the more Bill eats vegetables **the** less Mary wants t₁?
- (24) a. * Who_{t₁} did I say that **the** more t₁ eats vegetables, the less Mary wants sweets?
 b. * Who_{t₁} did I say that the more Bill eats vegetables, **the** less t₁ wants sweets?
- (25) a. ✓ Who_{t₁} did I say that **the** more for all intents and purposes t₁ eats vegetables, the less Mary wants sweets?
 b. ?? Who_{t₁} did I say that the more Bill eats vegetables, **the** less for all intents and purposes t₁ wants sweets?

2.1.3 *the* as a complementizer in other English expressions

While it's not unheard of for an individual lexical item to be so specialized that it only occurs in one kind of expression in a language, it would be preferable if comparative correlatives were not the only use for the complementizer *the*. Fortunately for *the*, it appears that they may be useful for more than comparative correlatives. The examples in (26) are named Nominal Extraposition (NE) by Michaelis & Lambrecht (1996) who examined the data in detail. The sentences appear to consist of a saturated expression (*It's amazing/perfect/sickening*), followed by head noun and a relative clause, as evidenced by the data in (27). But if the apparent relative clauses in (26) are indeed relative clauses, this constitutes a problem for the selectional properties of the predicates that precede

them. Normally, the predicates *amazing*, *perfect*, and *sickening* subcategorize for a CP, as in (28). If the predicate is followed by a nominal other than the apparent relative clauses in (26), the result is unacceptable, as in (29).

- (26) a. It's amazing the people you see here these days
 b. It's perfect the way the sun sets in the winter
 c. It was sickening the amount of waste there was
- (27) a. [The people you see here these days] are weird
 b. [The way the sun sets in the winter] is beautiful
 c. Please give me a report of [the amount of waste there was]
- (28) a. It's amazing [_{CP}that [we survived]
 b. It's perfect [_{CP}that [the weather cooperated]
 c. It was sickening [_{CP}that [the waste was so excessive]
- (29) a. * It's amazing the people/that person/those people/a person/some people
 b. * It's perfect the way/that way/those ways/a way/some ways
 c. * It was sickening the amount/that amount/those amounts/an amount/some amount

If we treat the *the* at the start of these apparent nominals as a complementizer, then these clauses are CP complements of the predicates. It is not that the predicates *amazing*, *perfect*, and *sickening* in NEs have taken a complement other than CP, or that a relative clause has been right dislocated; rather, the predicates in NEs have taken a CP complement just as they do in expressions like (28). Further evidence that the word strings beginning with *the* in (26)a-c are CPs comes from NEs that take other kinds of CPs, such as (30), and Michaelis and Lambrecht's virtually synonymous examples (5)a and b, reproduced here as (31)a and (31)b.³⁸

³⁸ Michaelis and Lambrecht provide these examples to contrast NEs with Right Dislocation, such as (i) a and b.

- (i) a. ✓ They're amazing, the things children say.
 b. * They're amazing, what things children say.

Despite the presence of the examples in (31)a&b in their paper, they do not consider the possibility that *the* is a complementizer, rather than a determiner.

- (30) It was sickening [how much waste there was]
 (31) a. It's amazing [what things children say]
 b. It's amazing [the things children say]

Crosslinguistically we see many languages (Dutch, Spanish, Brazilian Portuguese, Latin as reported by Den Dikken (2005) for example) use a morpheme meaning “how much/how more” to introduce the subordinate clause of a comparative correlative. Russian and Turkish introduce the first clause with a similar type of string -- a *wh*-item corresponding to *what* + much is used (see (36)-(37)).

- (32) Dutch
Hoe meer je leest, **hoe meer** je begrijpt
How more you read *how more* you understand
 “The more you read, the more you understand”
- (33) Spanish
Cuantos más problemas resolvió Joan, mejor puntuación recibió
How-much more problems solved Joan better score she-received
 “The more problems Joan solved, the better score she received”
- (34) Br. Portuguese
Quanto mais problemas a Joana resolve, melhores notas ela recebe
How-much more problems the Joana solves better scores she receives
 “The more problems Joan solved the better score she received”
- (35) Latin³⁹
Quanto in pectore hanc rem meo magis voluto,
How-much-ABL in heart this matter my more ponder
 tanto mi aegritudo auctior est in animo
that-much-ABL me grief greater is in spirit
 “The more I turn this matter over in my mind, the greater grief is in my soul”
- (36) Russian
Chem bol'she vina, tem veseleye
What-INST more wine-GEN *that-INST* merrier
 “The more wine, the merrier”

³⁹ This example is originally given by Michaelis (1994) and is repeated as example (10) in Den Dikken (2005).

(37)

Turkish

Ne **kadar** rahatla-r- sa- k, o kadar vakit kaybed- er- iz
what much relax aorist COND. IP it much time lose- aorist IP
“The more we relax, the more we waste time”

2.1.4 unique lexical items in comparative correlatives in other languages

In a similar vein as the last subsection, it would be preferable if there were evidence that languages other than English also have an unusual or relatively unique lexical item that appears in comparative correlatives. In Basque comparative correlatives, two lexical items, *gero* and *eta*, appear together and introduce both clauses of the comparative correlatives, as in (38). *Gero eta* is unique to comparative correlatives. Elsewhere in Basque, *gero* and *eta* appear independent of one another – *gero* is an adverb meaning “after” and *eta* is a conjunction meaning “and”. Within comparative correlatives, the two words must both be present and they must be adjacent; to restate, nothing can intervene between the two in a comparative correlative, and neither *gero* nor *eta* can occur alone in the comparative correlative. Yet, there is nothing compositional about the lexical items that would render a meaning in the comparative correlative equivalent to that of “the more” in English. This suggests that Basque speakers treat the *gero eta* in comparative correlatives as a single lexical item, and one that exists only in comparative correlatives.

(38)

Basque

Gero eta Jonek sagar gehiago bildu, **gero eta** pastel
CC John-ERG apples more pick, CC pies
gehiago egiten zituen bere amak
more did AUX-TRNS-PAST his mom-ERG
“The more apples John picked, the more pies his mother baked”

2.1.5 Other characteristics of *the*

This complementizer must be different from those already in the lexical inventory for English, otherwise its presence would be unnecessary. In §6 of chapter II, two semantic analyses were reviewed, each of which had something to say about what *the* contributed to the semantic composition of the entire expression. In chapter II, §6.3, we explored what the possible semantics for *the* could be. I repeat here what I asserted previously. As we will see in the next section of this chapter, *the* is obligatorily followed by what I term the *comparative constituent*, a string of words whose meaning can be construed lower in the phrase and that includes some comparative morpheme in English. I suggest here that the morpheme *the* takes as its complement the maximal projection of a functional head, and that this functional head triggers the overt syntactic movement of the comparative constituent in order to check semantic features. The selection of this complement by *the* implies that the semantics of both the *the*-head and the lower functional head are important to the full expression. What the semantic features of *the* are, I leave for further work. What I will suggest here is that comparative correlative's *the* constitutes an instance of a single lexical item which can enter the derivation and assume a category label needed for that derivation while retaining its semantic features. In the case of *the*, this specifically means that the definite determiner *the* which has been proposed to hold semantic features like uniqueness, definiteness, and maximality; these features may prove essential to successfully create the arguments of comparison which is required under either Beck's (1997) or Lin's (2007) proposal. The morpheme *the* in comparative correlatives may have very similar semantic contribution to the definite determiner *the*. However, both clauses of the comparative correlative are not DPs; they

are CPs. Instead of being associated with the category D, *the* in comparative correlatives is a C, a complementizer that holds the semantic features of the definite determiner. The semantic component of the grammar is able to use a lexical item independent of its syntactic category to derive the interpretation of an entire expression. In the same way, the syntactic component of the grammar is able to derive a syntactic structure provided all LF uninterpretable features are eliminated from the syntactic object by the time it reaches the C-I interface; as long as the syntactic category that each head has allows them to be combined in a principled and predictable way, the semantics of those particular heads is left to the C-I interface to render semantic interpretation.

2.1.6 Intermediate Conclusion

Given the data and discussion just presented, I will assume that classifying *the* as a complementizer is a well-grounded assertion and move onward.

2.2 Comparative constituent

Moving directly from the previous section, the lexical material which immediately follows the complementizer *the* is the *comparative constituent*. Let's look at our basic comparative correlative, reproduced from (2) earlier in this chapter.

(39) The more apples you eat, the healthier you'll be

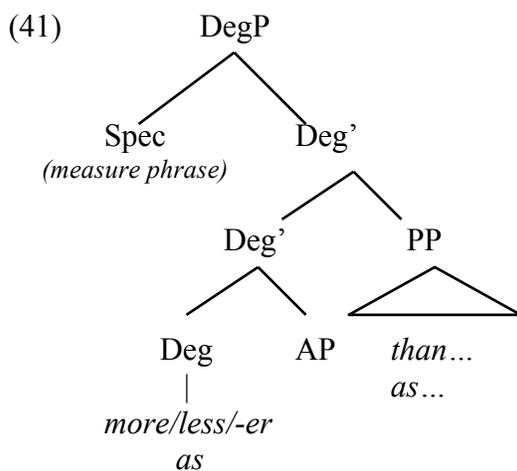
The comparative constituent in the first clause is *more apples* and in the second clause it is *healthier*. In each clause, the meaning of this constituent is construed lower in the clause. This is clear if we compare the comparative correlative to the semantically synonymous inverted comparative correlative (ICC), in (40).

(40) You'll be healthier, the more apples you eat.

The AdjP *healthier* is in its canonical post-verbal position. I propose that this position is where the comparative constituent was base-generated and that in each clause, this constituent moves to its higher, clause-initial position. Before discussing that movement in more detail however (we'll return to this in §2.2.2), I will first deal with what the syntactic structure of this constituent is.

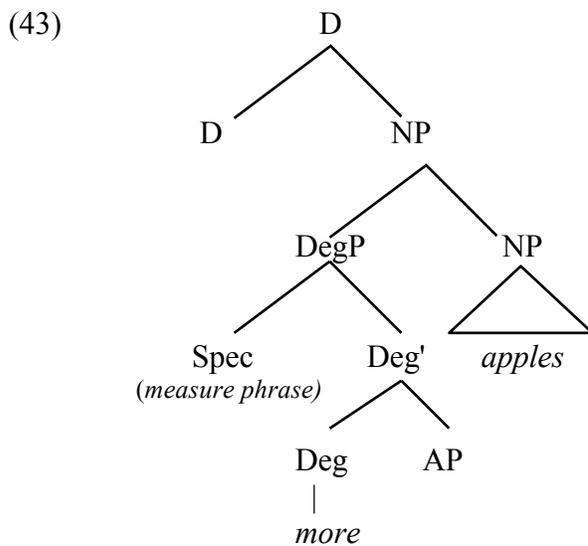
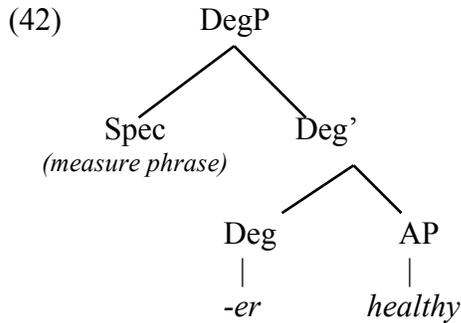
2.2.1 Structure of DegP

As the term I have given it implies, the comparative constituent is a syntactic constituent. In English, the comparative modifies AdjP, AdvP, NP or TP. The comparative constituent either is or contains a degree phrase (DegP). Following Kennedy (1997), a DegP has the structure in ((41)



The parts of a comparative correlative's DegP are identical to those in a standard comparative's DegP. The complement of Deg⁰ can appear if the Deg⁰ modifies an AdjP or AdvP, as in the second clause of (39) (this structure is shown below in 0). If the comparative modifies a nominal, as in the first clause of (39), the DegP is adjoined to NP, which in turn is dominated by DP (similar to attributive comparative deletion as proposed by Kennedy & Merchant, 2000) as shown in (42) below. In cases of nominal

modification, the entire DP moves. Why this entire DP moves instead of just the DegP, I will address below in §2.2.2.



It is noted that in English comparative correlatives, the Deg⁰ of each clause of the comparative correlative cannot take a measure phrase, as in (44)).

(44) * the **six hours** longer the storm lasts...

Den Dikken (2005) proposes that the measure phrase of the DegP in English is filled with a null morpheme. Though the micro-structure he proposes differs significantly from the one I am proposing in this section, (most notably, he treats the obligatory *the* as a Deg⁰), I critically adopt his null measure phrase in Spec,DegP. Den Dikken (2005) provides historical motivation for this measure phrase in English with examples like (45)) (Den Dikken's (14b)).

- (45) By how much the better then my word I am, by so much shall I falsifie mens hopes. (Shakespeare, Henry the Fourth; 16th c.)

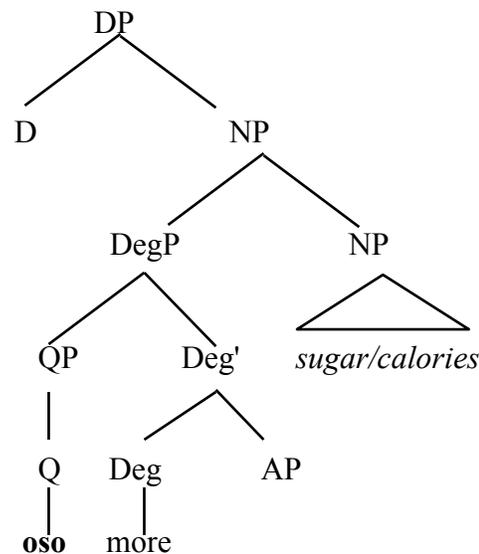
This measure phrase can no longer be overt in Modern English, and he concedes (as do I) that the motivation for this change and restriction is unknown. However, there is substantial cross-linguistic data that support the assertion that such a null measure phrase exists. In many languages, the first clause begins with a *wh*-quantifier phrase (usually glossed as “how much” or “what much”) and the second a definite QP, glossed as “that much.” We saw some of these examples in previously in §2.1.3, like Spanish, Brazilian Portuguese, Latin, and Turkish. I’d like to illustrate this further using data from Modern Greek. A typical comparative correlative is in (46) below.

- (46) Modern Greek
 oso pio poli zahari tros toso pio poles thermides
 as.much.as more sugar eat.2sg.pres that.much more calories
 pernis
 get.2sg.pres
 ‘The more sugar you eat, the more calories you get’

Similar to the other language examples just cited, Greek’s *oso* (in the start of the first clause) is glossed here as “as much as” and *toso* (in the second clause) is “that much.” There is not enough evidence to support a proposal that a quantifier or quantifier-like morpheme appearing in this position in a language other than English is similar to English’s *the*. If this is the case, such languages have a null C in each clause and we must either assume that such a morpheme is dominated by a CP or is higher in the structure than the CP. I propose that such quantifiers are in SpecDegP and operate as the measure phrase for the DegP. Since we never see a morpheme of this kind in English’s comparative correlatives, in fact, comparative correlatives cannot tolerate any measure phrase whatsoever, it is reasonable to propose that a measure phrase is there and is filled

by a phonetically-null morpheme. In this way, the parametric variation across languages (between English-like languages with no overt measure phrases and Greek-type languages with obligatory quantifier-like measure phrases) reduces to overt vs. covert phonological features. In prior work (Kapetangianni & Taylor, 2009), in a far more extensive investigation of the morpheme *oso*, we argued that *oso* is a quantifier, and the QP it projects constitutes a measure phrase. This measure phrase will occupy Spec, DegP in the first clause of the comparative correlative. Its semantic interpretation is one of amount “as.much.” The resulting structure, using terminal nodes from that first clause of (46) is seen below in (47). I adopt these details of that prior proposal here.

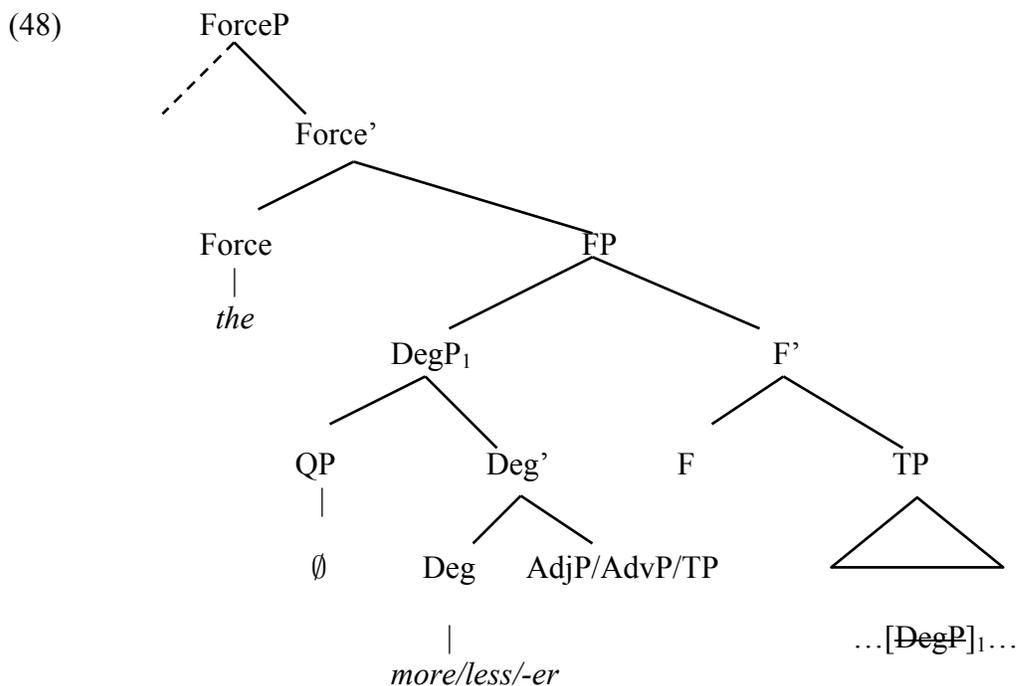
(47)



2.2.2 Movement of DegP

Now that the structure of the comparative constituent has been established, let’s move on to addressing its movement. The DegP, or in the case of NP modification, the NP which contains the DegP, is base-generated in its canonical syntactic position, then A’-moves out of TP into the CP domain. It is at this point in this proposal where I will address the details of this domain and exactly where each element is positioned.

Following Rizzi (1997), I take the highest projection in the expanded CP domain to be ForceP, where *the* is the Force head. The DegP or the NP containing the DegP moves from its base-generated position to Merge with the projection of a functional head, F^0 , becoming the specifier of that FP. It follows, then, that the features of this F^0 that trigger the movement of the DegP to the specifier position of the sister of Force^0 , where such features can be checked. This functional phrase (FP) is the syntactic sister of Force^0 , *the*. See (48) for an example of a non-nominal comparative constituent after movement. It can now be seen clearly that there is no way for the clause-initial *the* and the word string after it (comparative + modified constituent) to form a constituent.



Some of the structure here is shown that also may not be needed, like SpecForceP. If this position is not needed for successive cyclic movement, then this position will never be projected.

2.2.3 Movement of NP which contains DegP

The last issue I will address in this section is NP movement when the DegP is contained inside an NP. Following Kennedy & Merchant (2000), a DegP that modifies an NP is left-adjoined to that NP. It appears that in comparatives correlatives, the entire NP A'-moves to Spec,FP instead of just the DegP. This is a result of the Left Branch Condition, which applies to not only in English, but also in Modern Greek (as demonstrated by Kennedy & Merchant 2000). In case of *wh*-movement of an attributive DegP, the entire NP must be pied-piped with the DegP in both English and Greek, as examples (49) and (50) illustrate.⁴⁰

- (49) a. *How interesting did Pico write a novel?
b. How interesting a novel did Pico write?
- (50) a. * **Poso megalo** agorase o Petros **ena aftokinito**?
How big bought the Petros a car
- b. **Poso megalo aftokinito** agorase o Petros?
How big car bought the Petros
'How big a car did Peter buy?'

In cases of attributive comparative deletion, both Greek and English require that the NP that a DegP modifies may not be stranded when the DegP undergoes movement as shown in (51) and (52):

- (51) * Erik drives a more expensive car than Polly drives a motorcycle.
- (52) * O Petros agorase ena megalitero aftokinito apoti o
the Petros bought a bigger car than+what the
Giannis agorase ena dzip
John bought a jeep
lit. "Petros bought a bigger car than Giannis bought a jeep"

⁴⁰ Examples (49)-(52) are from Kennedy & Merchant (2000).

2.2.4 Other supportive crosslinguistic data

Now that we have this last piece of the puzzle, we can see the crosslinguistic parallelism of the syntax of comparative correlatives. Example (46) has the structure in (53)) for both Greek and English.

- (53) a. **the** [_{DegP} [_{QP} \emptyset] more sugar] you eat, **the** [_{DegP} [_{QP} \emptyset] more calories] you get
b. \emptyset [_{DegP} [_{QP} **oso**] pio poli zahari] tros, \emptyset [_{DegP} [_{QP} **toso**] pio poles thermides] pernis

This crosslinguistic structural similarity does not end with these two languages. We can apply the same analysis to other languages. Here I give examples from Hindi and Brazilian Portuguese which fit into this proposal as well. Two examples of Hindi comparative correlatives are below in (54)a&b. The morpheme *jitn-* (realized as *jitnii*, *jitnaa*, or *jitne*) appears at the start of the first clause, which translates as “how much.” As a *wh*-quantifier, it can serve as the measure phrase in SpecDegP, the measure phrase which is necessarily present and phonologically null in English. In the second clause we see *utn-*, which translates as “that much,” similarly to Modern Greek’s *toso*. In Brazilian Portuguese (in (34), reproduced as (55) below), we can see the quantifier *quanto* appears clause-initially in the first clause. This always occurs in other Romance languages, such as Spanish and Latin as seen in (33) and (35) respectively. Again, this is the measure phrase in this clause. In the second clause, no overt morpheme exists that can perform the duties of the measure phrase. In this way, Brazilian Portuguese has both overt and null morphemes which are part of the lexical inventory available for building comparative correlatives.

(54)

Hindi

a. **Jitne** zyaada sawaal Joanna sujhaae, use **utne** acche
how-much more problem Joan-ERG solved to-her that-much good
ank aaye
score came

“The more problems Joan solved, the better score she received”

b. **Jitnii** jaldii Bill kaam karega, use **utnaa** zyaadaa mithaaii milegii
how fast B. work do-FUT he-DAT that more sweets get-FUT
“The more quickly Bill finishes his work, the more dessert he will get”

(55)

Br. Portuguese

Quanto mais problemas a Joana resolve, melhores notas ela recebe
How-much more problems the Joana solves better scores she receives
“The more problems Joan solves, the better score she receives”

2.3 Section conclusion

We’ve covered the most important parts of the microstructure of comparative correlatives, that is, the innards of each clause. The microstructure includes an enriched CP-domain and a functional head that drives movement of the comparative constituent from within the lower TP to the specifier position of that functional head. The analysis assumes that heads have a rich feature matrices and that Merge and movement is motivated in part by the need to check those features. It follows from these details that the individual heads are driving the derivation without appealing to phrasal or sentential constructions. Further, the microstructure as I have just proposed it is necessarily endocentric as demanded by bare phrase structure (Chomsky, 1995b).

As with any linguistic data, there are still other structural parts which may appear in environments not discussed in this section. As they become relevant later in this chapter, we will incorporate them into the structure we have already established in (48).

3. Macrostructure

In this section, we will primarily be concerned with the structural relationship between the two clauses of the comparative correlative. As we saw in the last section, each clause is a ForceP, the head of which is the Force⁰ *the*. When it is convenient for the sake of exposition, I will use the term CP to refer to the entire CP domain, however I henceforth assume an expanded version of CP is essential for a successful analysis of the data.

3.1 Relationship between the two clauses at Spell-Out

In chapter II, we saw copious data that examined the question of what the structural relationship between the two clauses of a comparative correlative is. I will reproduce this data here as (57)-(60). As the reader may recall, almost all of the data support the conclusion that the second clause (linearly) is the main clause (i.e., root clause, matrix clause) and that the first is subordinate to it. The only data that would cause one to doubt this conclusion is that movement (specifically A'-movement) out of the first clause is possible. We will put this issue to the side temporarily (we will return to it in §3.3) and assume that the conclusion is correct, as notated in (56).

(56) The longer we look at this problem, the easier it seems
subordinate clause *main clause*

The data supporting this conclusion are below. The verb in the second clause, and not the first, hosts tag questions in a comparative correlative (example (57)). If a comparative correlative is embedded under a predicate that triggers subjunctive mood, that mood is hosted on the verb in the second clause (example (74)). In (32) we have an example of a German comparative correlative. German, as verb-second language, shows this behavior in the first clause where the finite verb *wohnst* is in clause-final position.

This is behavior we expect to find in a subordinate clause. In the second clause, the finite verb *wirst* immediately follows the comparative constituent *desto besser*, differently than what we would expect if this were a subordinate clause.

(57) examples (73) in chapter II

- a. ✓ The more we eat, the angrier you get, don't you?
- b. * The more we eat, the angrier you get, don't we?

(58) It is imperative that/I demand that... examples (74) in chapter II

- a. ✓ ...the more John eats, the more he pay(s).
- b. * ...the more John eat, the more he pay(s).

(59) example (32) in chapter II

je länger du in Deutschland wohnst, desto besser wirst du Deutsch sprechen
*je longer you in Germany live desto better will you German speak*⁴¹
 'The longer you live in Germany, the better you will speak German.'

The last evidence we will examine as evidence for classifying the first clause as subordinate is binding data involving donkey anaphora, again, first seen in chapter II (examples (87)a-c in that chapter). The *if*-clause of a conditional and clauses like those headed by temporal prepositions like *while* and *after* are uncontroversially classified as left-hanging subordinate clauses, i.e., adjuncts. By using these types of clauses as comparison, we can see whether binding conditions between these types of subordinate clauses and the main clause in their expression are similar to what we see in comparative correlatives. In (60)a-c, we can see that all three types of sentences have the same behavior with respect to donkey anaphora.

⁴¹ In this example, originally from McCawley (1988), I have left the gloss of *je* and *desto* not translated. McCawley (1988) and Beck (1997) treat this item as a crosslinguistic instance of English's *the*. Roehrs, Sprouse & Wermter (2002) give evidence that this is not a correct conclusion. The discussion in §2.1 of this chapter, that *the* is a complementizer heading each clause, casts even greater doubt that *je* and *desto* are the same lexical item as English's *the*. As I have not done in depth analysis of comparative correlatives in German, I leave this gloss as it is here without any further discussion.

- (60) a. If [a farmer]₁ loves [a pig]₂, he₁ feeds it₂
b. The more [a farmer]₁ loves [a pig]₂, the more he₁ feeds it₂
c. Because [a farmer]₁ loves [a pig]₂, he₁ feeds it₂

I take this combined data as strong evidence that the first clause is subordinate to the first.

Now that we know which clause is the main clause, the next step is to determine the relationship between the two clauses.

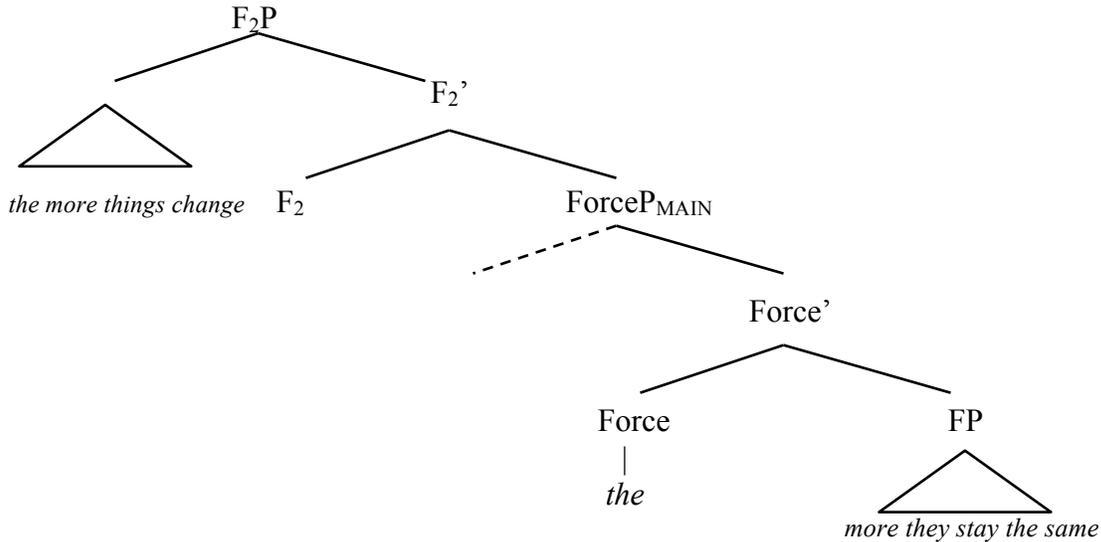
We know that the main clause is a CP, with the highest projection of this CP domain being ForceP. A good first guess at where the subordinate clause is attached to the first would be in an already proposed functional projection in this expanded domain. There are two reasons this cannot be correct. First, the word order would be wrong. The highest projection is ForceP, which *the* heads. If the subordinate clause were located in a lower projection, we would get an unquestionably unacceptable comparative correlative, something like (61), intended to mean the same thing as the grammatical, *the more things change, the more they stay the same*.

- (61) * the the more things change more they stay the same

There are two options left: the subordinate clause is adjoined to the main clause ForceP, or there is another functional projection immediately dominating ForceP_{MAIN} and the subordinate clause moves to the specifier position of that new functional projection. I assert that proposing a new functional projection is the better choice between these two and adopt this as part of my analysis. Aside from issues of theoretical elegance, there is independent support for choosing the functional projection approach over the adjunction approach. The first is a consideration of why this clause must appear at the start of the expression, even when its meaning is construed within the main clause VP. This is addressed immediately in the next section. The second reason regards movement out of

this clause, which will be addressed in the following section, §3.3. I propose that the position of the subordinate clause in a “garden variety” comparative correlative is in SpecF₂P as in (62) below.

(62)



3.2 Base-generated position of the subordinate clause

Thinking a bit more derivationally, we still haven't addressed the question of where the subordinate clause begins in the derivation. The two possibilities are that (i) it is base-generated in its high specifier position or (ii) it is base-generated lower in the structure, presumably within the matrix VP, and then moves to its higher position. In what follows, I will argue that both options are possible and represent a dialect split among English speakers.

In order to probe this question, I'll use standard tests for A'-movement (Chomsky, 1977). With respect to test for A'-movement, the following examples are relevant:

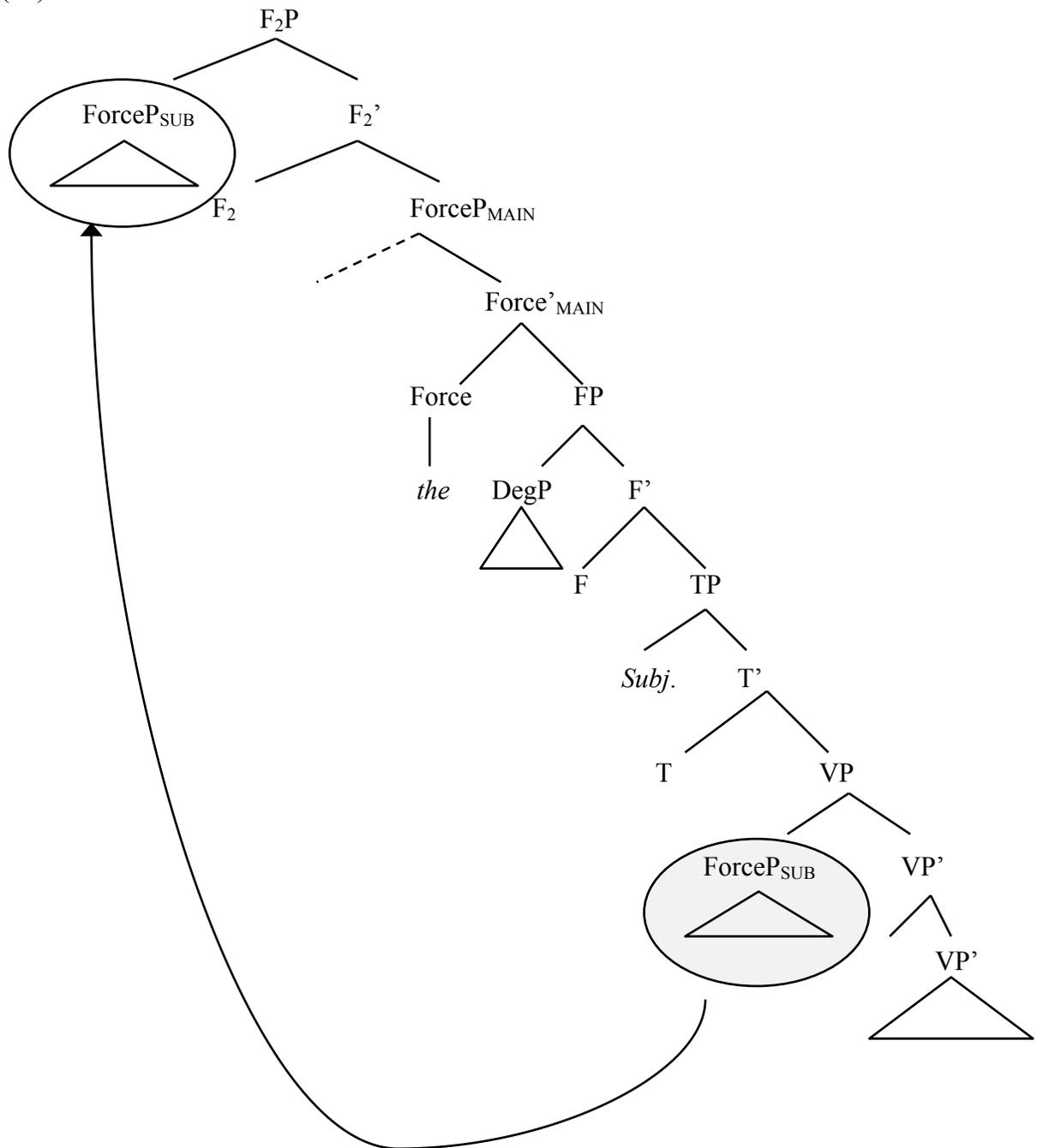
- (63) The more it rains, the less likely it is that Bill will come
(64) The more it rains, the less likely it is that Mary believes/said/heard/assumed that Bill will come
(65) * The more it rains, the less likely it is that Mary heard the rumor that Bill will come

Let us take (63) to be our base sentence. If the subordinate clause has been base-generated as an adjunct to the matrix VP, we assume that a gap site is present in this expression, either before or after the VP *come*. If we try to construe the meaning of the subordinate clause under a bridge verb like *believe/said/heard/assumed*, this meaning can be obtained and the expression is acceptable as in (64). However, if the gap site is located within an NP, as in (65), this would constitute a violation of the Complex Noun Phrase Constraint (CNPC), and should result in an unacceptable expression. We see that this is the case.

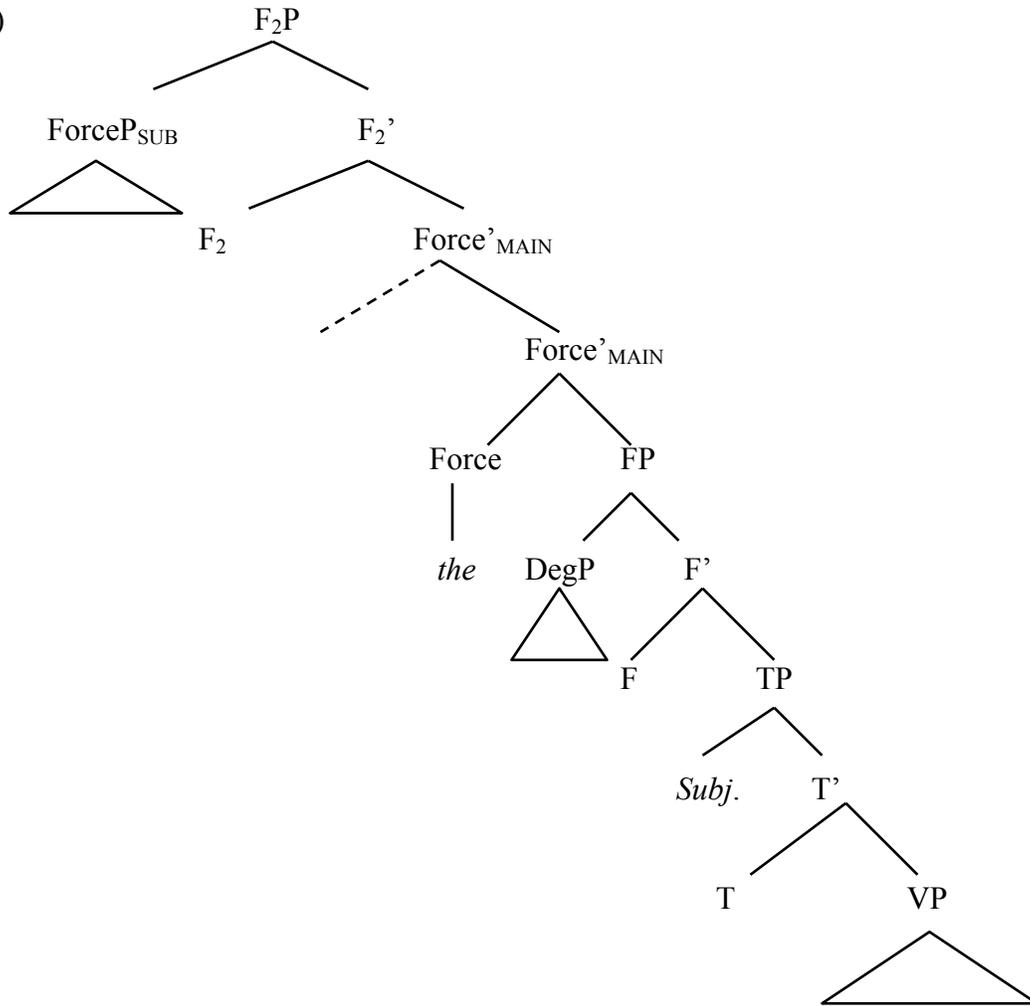
Speakers having the judgments given above have a grammar where the subordinate clause has been base-generated inside the VP. As we will see immediately below in the next subsection, §3.3, for some derivations of comparative correlatives the subordinate clause must be base-generated high in the structure, in sentence-initial position. For this reason, I propose that both derivations are available and that it would be unsurprising to find dialect differences with respect to the data in this subsection.

Because both possible derivations appear to be possible and necessary, I illustrate them both in the trees below. In (66), we can see the movement of the subordinate clause from its base-generated position within the matrix VP; in (67) no such movement is necessary since the subordinate clause is base-generated as an adjunct to the main ForceP.

(66)



(67)



I'll address now *why* the subordinate clause is in $SpecF_2P$ at SpellOut. Up until now, I have noted that the comparative correlative requires that the subordinate clause appear first linearly, an observation that holds not just in English, but in every language I have investigated with respect to this data. This functional head F_2 holds features that are checked with the subordinate clause. What those features are, I leave unanswered for now. Further, we assume that something about having *the*, this functional head F_2 , and F which hosts $DegP$ in its specifier position in the same numeration always results in a comparative correlative and always has the structure in (68) below.

(68) $F_{2P}[ForceP_{SUB} [F_2 ForceP_{main}[the_{FP}[F TP]]]]$

3.3 A'-movement out of the subordinate clause

If the reader will recall from chapter II, A'-movement of many kinds (*wh*-movement to an embedded Spec,CP, *wh*-question formation, clefting, Topicalization) is permitted from both the matrix and the subordinate clauses of a comparative correlative in English. Focus movement is also permitted from either clause. Examples of such movement are provided below. (69) is our basic comparative correlative. In (70) and (71) we see *wh*-movement to an embedded Spec,CP to satisfy the selectional requirements of the matrix verb *wonder*. As we discovered in §2.1.3, T-to-C movement is disallowed in the matrix clause of comparative correlatives, however, *wh*-movement to form a *wh*-question can occur if the entire expression is embedded under a Stance predicate like *believe*; (72) and (73) are examples of such *wh*-questions. (74)-(75) are examples of clefting, (76)-(77) Focus, and (78)-(79) Topicalization.

- (69) The more thoroughly a high school student writes this essay, the more competently she will complete the college coursework once she is an enrolled freshman.
- (70) I wonder **what**₁ the more thoroughly a high school student writes ___₁, the more competently she will complete the college coursework once she is an enrolled freshman?
- (71) I wonder **what**₁ the more thoroughly a high school student writes this essay, the more competently she will complete ___₁ once she is an enrolled freshman?
- (72) **What**₁ does the new admissions counselor believe that the more thoroughly a high school student writes ___₁, the more competently she will complete the college coursework once she is an enrolled freshman?
- (73) **What**₁ does the new admissions counselor believe that the more thoroughly a high school student writes this essay, the more competently she will complete ___₁ once she is an enrolled freshman?

- (74) This is the kind of essay₁ that the more thoroughly a high school student writes ___₁, the more competently she will complete the college coursework once she is an enrolled freshman.
- (75) This is the kind of college coursework₁ that the more thoroughly a high school student writes this essay, the more competently she will complete ___₁ once she is an enrolled freshman.
- (76) **THIS ESSAY**₁ (not homework assignments), the more thoroughly a high school student writes ___₁, the more competently she will complete the college coursework once she is an enrolled freshman.
- (77) **THE COLLEGE COURSEWORK**₁ (not the rush week requirements), the more thoroughly a high school students writes this essay, the more competently she will complete ___₁ once she is an enrolled freshman
- (78) **This essay**₁, the more thoroughly a high school student writes ___₁, the more competently she will complete the college coursework once she is an enrolled freshman.
- (79) **The college coursework**₁, the more thoroughly a high school student writes this essay, the more competently she will complete ___₁ once she is an enrolled freshman.

The macrostructure of comparative correlatives provides a way for A'-movement out of the matrix clause. Provided the targeted constituent is not inside an island within the second clause, it can move from its base-generated position within the matrix TP to the highest SpecForceP of the expression, which is the highest phase boundary in the structure at Spell-Out. A'-movement out of the subordinate clause, however, is less-straight-forward. All things being equal, we would expect that the adjunct is an island to movement, subject to the Condition on Extraction Domains (CED) (Huang, 1982). The CED (Huang, 1982) renders adjuncts islands, prohibiting movement out of all adjuncts. The CED correctly rules out examples like (80). Assuming the CED is correct, all movement out of the subordinate clause of a comparative correlative should likewise be prohibited. Yet there exists empirical data that give reason to argue that the CED is too

strong. Historically, parasitic gaps stood as such data (Chomsky, 1982; Engdahl, 1983).

In (81), the parasitic gap in the adjunct (marked as ‘pg’) is dependent upon the presence of the gap in the main clause (marked as ‘t’).

- (80) * Who₁ will Michelle go home because Rich saw t₁ ?
(81) ✓ [Which book]₁ did you review t₁ without reading pg₁ ?

In order to theorize why a dependency exists between the parasitic gap and the “real” gap, a story needed to be told that addressed how a parasitic gap inside an island would be different than a gap inside of all other islands. In more recent discussion of parasitic gaps, Nunes (1995, 2004) explored the phenomenon of parasitic gaps and proposed as a solution that adjuncts are islands to movement only after they are adjoined. If movement happens between trees (sideward movement) rather than within trees (internal merge), movement out of an adjunct is made possible under certain conditions. The proposal was that while an eventual adjunct is unadjoined, movement of a constituent from this tree to another is possible via sideward movement. Sideward movement does not throw out the CED; it clarifies what domains should be islands to movement according to the CED. The CED disallows extraction from adjuncts, and within the theory of sideward movement an adjunct is defined as that which is adjoined to another tree.

Sideward movement solves the problem of how movement out of an adjunct can be possible. But the operation of sideward movement as just defined encounters a new problem – overgeneration. If there is no sideward movement, movement is constrained by c-command relationships. By introducing an operation like sideward movement, c-command becomes irrelevant. As I have presented the operation of sideward movement so far, any constituent can move anywhere so long as that movement extends a tree

(assuming Extension applies universally). This freedom is undesirable because left unlimited in this way, sideward movement could render all islands violable. It is then essential to the theory of sideward movement that appropriate and principled limitations are in place in order to restrict its power. Four such limitations are proposed by Nunes (2004) and Hornstein (2001), given in (82).

(82)

- a. A derivation may access only one subnumeration (Chomsky 2001) at any given point in the derivation. Only when the items of a subnumeration are exhausted can items from another subnumeration enter into the derivational workspace.
- b. Only one tree may be extended during any given point in a derivation. If tree X exists in a derivation, and tree Y is created, tree Y must be built in its entirety before any other tree can be extended, and tree X may only be extended again if tree Y is adjoined to it.
- c. Like traditional intra-arboreal movement, sideward movement may only target items positioned on the edge of a tree.
- d. A sidewardly-moved constituent must always be copied and immediately merged with another constituent. Copied constituents may not exist in the derivational workspace unused.

Parasitic gaps are not the only data in which movement out of an adjunct appears to occur. Hornstein (2001) used and expanded the proposal of sideward movement to explain adjunct control via the elimination of Obligatory Control PRO (OC PRO). Movement out of the *if*-clause of a conditional is acceptable in English (Taylor, 2006, 2007) and Spanish (Etxepare, 1998). Thus the phenomenon of movement out of an adjunct is not unique to the comparative correlative in English. Rather, there is a growing body of data that demonstrate movement out of traditional adjuncts does occur. Movement of a constituent out of a clause cannot be taken to be solid conceptual evidence that the specific clause is not an adjunct. The question of how to move out of an adjunct is one that needs addressing.

Using the operation of sideward movement, we are now able to formulate a way by which movement out of the subordinate clause of a comparative correlative can occur.

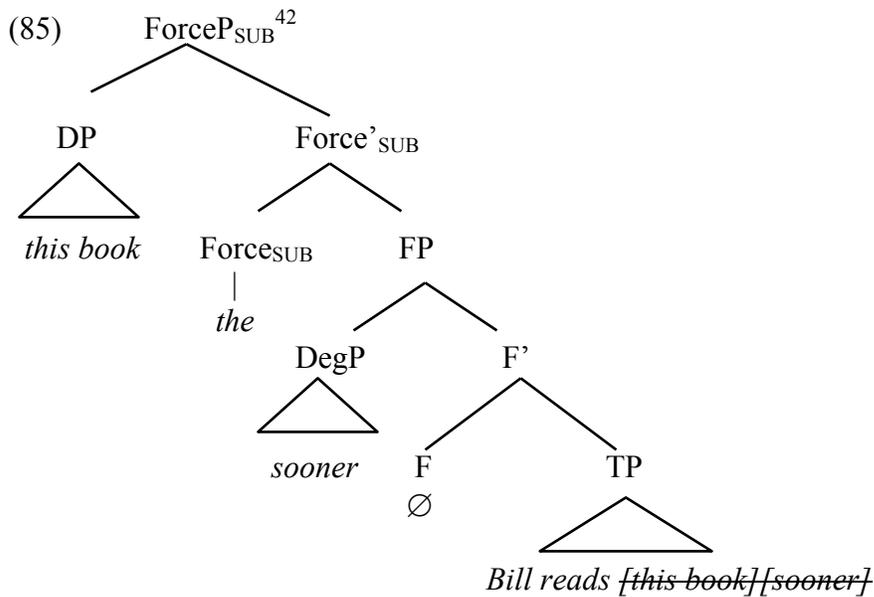
Let us consider the case of (83).

- (83) This book, the sooner Bill reads, the more likely he is to give up linguistics forever

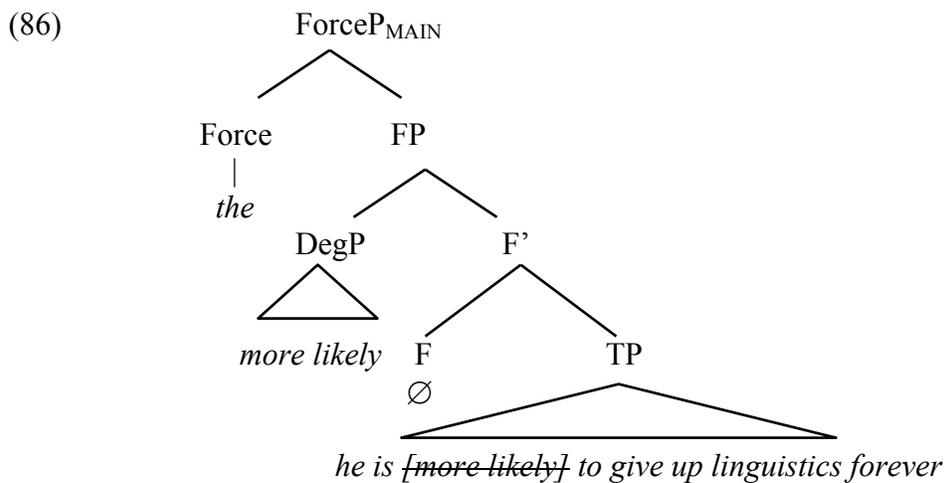
The topicalized DP *this book* is construed, thus it has been base-generated, as the object of the verb *reads* in the subordinate clause. The subnumerations used in the derivation of (83) are in (84) below.

- (84) a. subn α = {the, F, soon, -er, Bill, reads, this book } subordinate ForceP
b. subn β = {the, F, he, is more, likely, to give up, ling., forever} matrix ForceP
c. subn γ = {F₂, Top, Force} highest CP

First, subnumeration α is accessed and the subordinate clause (*the sooner Bill reads*) is built, with the constituent *this book* base-generated as the object of the verb, then A'-moving to the edge of the tree, in SpecForceP. This movement is motivated by +Top features the DP holds. They are not checked in this position, but the constituent moves to the edge of its phase, as that is what it must do if the features are ever to be checked later in the derivation. The resulting is in the structure in (85).



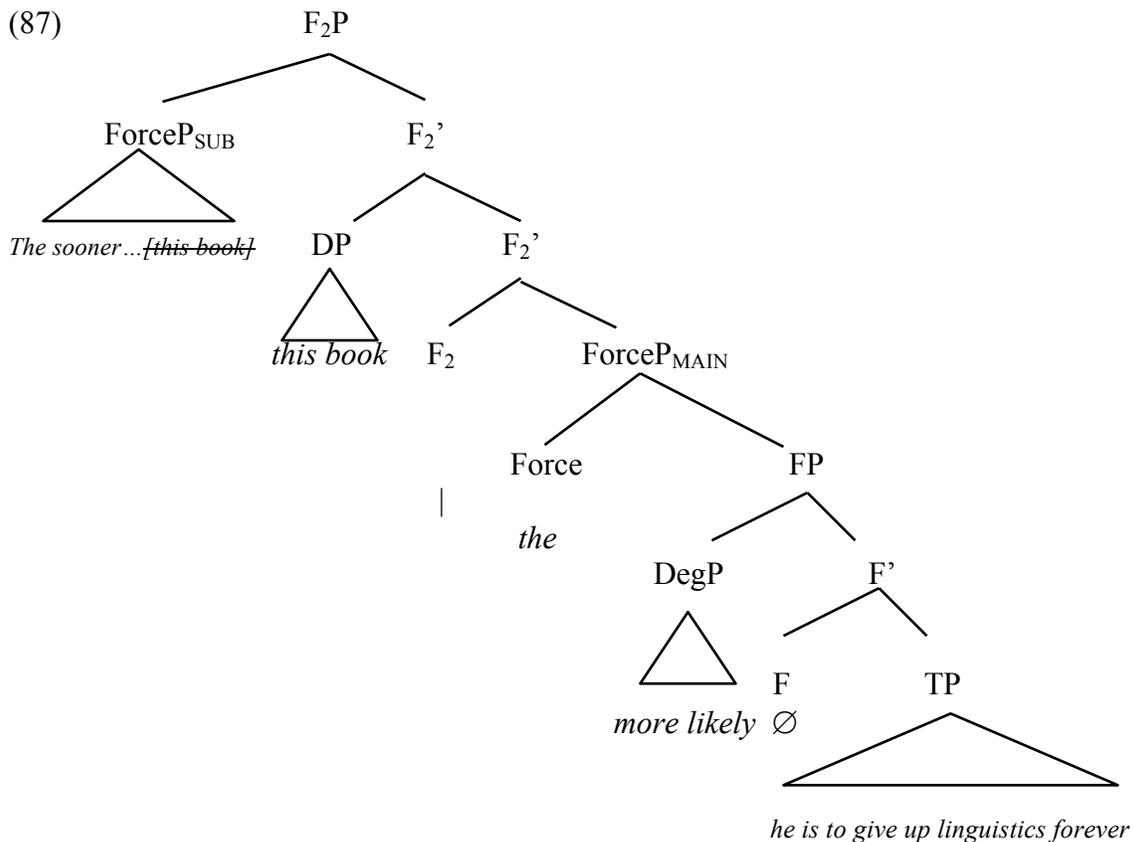
The next step is for the matrix clause (*the more likely he is to give up linguistics forever*) to be built by accessing subnumeration β . The resulting structure is similar to the subordinate clause, with the exception that nothing has moved out of the lower TP to the edge of the tree.



⁴² I have included the notation subscript on this ForceP *SUB* to note that it is the eventual subordinate clause, distinguishing it from the matrix ForceP. Importantly, I do this only for expository purposes and do not think this notation has entered the derivation in any way. The same is true for the notation *MAIN* with respect to the matrix clause.

At this point, subnumeration γ is accessed. The F_2 head can immediately be pulled out. This F_2 head is merged with the matrix ForceP. Crucially, at this point in the derivation, the subordinate clause is not adjoined to any other structure and as such is not an island to movement. The DP *this book* within ForceP_{SUB} can now sideward move from SpecForceP of the subordinate clause into SpecF₂P.

Remember from §3.1 and §3.2 that this SpecF₂P is where the subordinate clause in “garden variety” comparative correlatives (i.e., comparative correlatives with no movement out of the subordinate clause) is located at SpellOut. Because this position is occupied by the DP *this book*, the subordinate clause adjoins to the F₂P, extending this tree higher (see (87)).



Top⁰ is merged with this single rooted tree, and the DP *this book* is able to continue its A' ascension to the specifier of that head. The rest of the items in the subnumeration are merged onto the single rooted tree until all items are exhausted.

It was proposed just above in §3.2 (seen in example (67)) that one of the possible derivations for comparative correlatives is for the subordinate clause to be base-generated in sentence-initial position and adjoined to the matrix ForceP. This is critical due to the limitations to sideward movement given in (82). If the subordinate clause is base-generated low in the structure and A'-moves to adjoin to the matrix ForceP, movement from the subordinate clause will necessarily result in unacceptability. To demonstrate this, consider a different derivation of (83), using the same subnumerations in (84). The subordinate clause (*the sooner Bill reads t*) is completely built with all the items from subnumeration α , as before, including the A'-movement of *this book* to SpecForceP.

The next subnumeration to be accessed is β (in (84)b). If the subordinate clause is base-generated low as an adjunct to VP, it must be adjoined to the VP within the access to this subnumeration. But once the subordinate clause is adjoined, it is an island to movement. Therefore, if *this book* is to sidewardly move out of the subordinate clause, this movement must take place before the subordinate clause is adjoined to VP. It is at this point in the derivation that a problem arises. At the point in the derivation that the adjunct must be adjoined to VP, there are elements still remaining in subnumeration β , yet no element in subnumeration β nor any constituent formed by the elements of subnumeration β are able to successfully merge with the DP *this book*. The limitation in (82)a prevents accessing elements in another subnumeration (such as Top in subnumeration γ). The DP cannot be copied and remain in the derivational workspace

unmerged due to the limitation in (82)d. At this point, the derivation arrives at an impasse – no matter what step is taken next, some violation of the grammar will necessitate and the derivation will crash.

In a similar fashion to the successful derivation of (83), which included the functional head F_2 in numeration γ , A' -movement out of the subordinate clause can successfully occur in the cases of Focus, embedded *wh*-phrases, and clefting. In the case of *wh*-questions, which require the entire comparative correlative to be embedded in order for successful A' -movement out of either clause to be tolerated, I propose here that a more economical derivation is available.

The embedding predicates that we have seen in this context so far are what have been termed Stance predicates (Cattell 1978), such as *say*, *believe*, *claim*, or *think*. Etxepare (2002) investigated null complementizers in Spanish and explained a number of empirical phenomena by postulating a null complementizer that is the realization of Uriagereka's (1995) functional projection F. Etxepare proposes the projection F is present in a derivation when a Stance predicate (Cattell 1978) is present. His jump to concluding that F must exist in the presence of Stance predicates is straightforward – Stance predicates involve an assertion on the part of the speaker, and Uriagereka's F “hosts all those elements which in order to be interpreted require a ‘responsible judge.’”

Relevant to the discussion here, Etxepare notes that in Spanish, if a conditional is embedded under a Stance predicate, such as *say*, *believe*, *claim*, or *think*, movement from a sentence-initial *if*-clause is readily permitted. His example (49) in Spanish is reproduced here as (88). Note that the corresponding expression with the *if*-clause in sentence-final position in (89) is unacceptable.

- (88) Qué libro₁ crees que si Ricardo lee t₁ alguna vez abandonará
which book believe you that if R.. reads some time give up
 la Lingüística de inmediato?
the Linguistics immediately
 “Which book do you believe that if Ricardo ever reads he will give up linguistics immediately?”
- (89) *Qué libro crees que Ricardo abandonará la Lingüística
which book believe you that R. give up the Linguistics
 de inmediato si lee t alguna vez
immediately if he reads some time
 “Which book do you believe that Ricardo will give up linguistics immediately if he ever reads?”

Similar to comparative correlatives, conditionals in English behave in this same way that Etxepare described for Spanish. In (90), movement to the matrix Comp for question formation is disallowed, and when the same expression is embedded under a Non-stance predicate as in (91), *wh*-movement to the matrix Comp results in questionable grammaticality. But when this same expression is embedded under a Stance predicate as in (92), *wh*-movement from the *if*-clause results in an acceptable expression. Regardless of whether the conditional is embedded under a Stance predicate, if the *if*-clause is sentence-final, movement out of this *if*-clause results in unacceptability, as seen in (93). This is important for our discussion because a sentence-final *if*-clause is argued to be adjoined to the matrix VP, exactly where we have seen the subordinate clause base-generated in low-construal cases.

- (90) * Which play₁ if the coach sees t₁ then will the Lions will win the game?
 (91) ?? Which play₁ did you speculate/omit/interpret/comment that if the coach sees t₁ then the Lions will win the game ?
 (92) ✓ Which play₁ do you say/believe/claim/think that if the coach sees t₁ then the Lions will win the game ?
 (93) * Which play₁ do you say/believe/claim/think that the Lions will win the game if the coach sees t₁ ?

Let us assume that these facts for conditionals in both English and Spanish, as well as their parallelism to comparative correlatives, give good support for proposing that

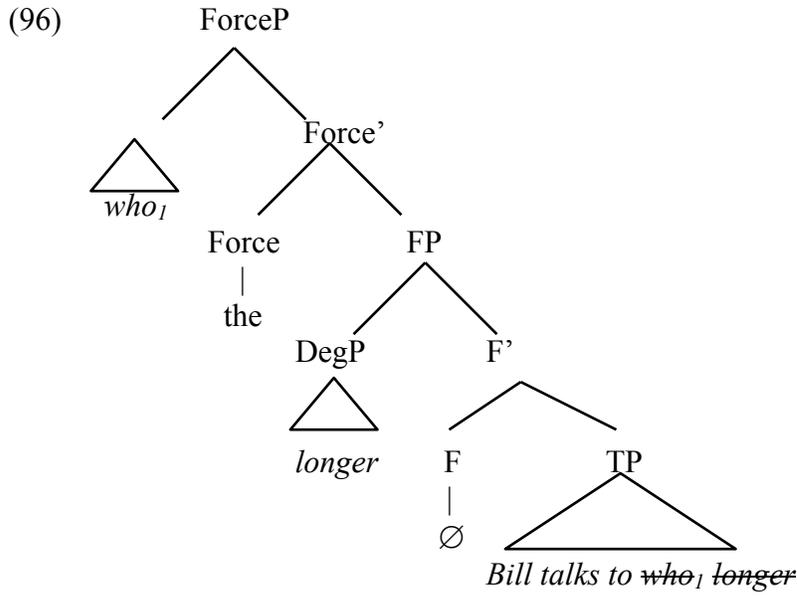
a functional head in the CP domain Stance^0 or a functional feature $+stance$ exists in the grammar. In the following derivation, I assume that Stance is an X^0 which occurs in the matrix ForceP of the sentence embedded under the Stance predicate.

Now we are prepared to consider a derivation of a comparative correlative with *wh*-movement to the highest COMP position. Consider the expression in (94).

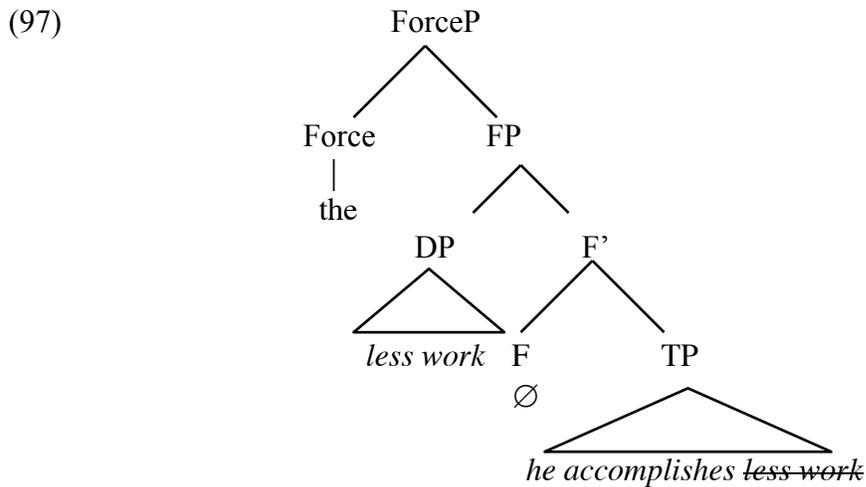
(94) Who₁ do you believe the longer Bill talks to t_1 , the less work he accomplishes?

The subordinate clause (*the longer Bill talks to t_1*) is completely built with all the items from subnumeration α . The result is a ForceP as in (96). The *wh*-phrase *who* is base-generated as the object of the verb *talk to* and successive cyclically A' -moves to Spec,ForceP of this subordinate clause. From this position, it can continue moving to a higher A' -position at later stages in the derivation (in accordance with the limitation in (82)c).

- (95)
- | | |
|---|-------------------------|
| a. subn α = { <u>the</u> , F, long, -er, Bill, talks to, who } | adjunct ForceP |
| b. subn β = { F_2 , Stance , <u>the</u> , F, he, accomplishes, less, work} | matrix ForceP |
| c. subn γ = {v, believe} | vP |
| d. subn δ = { Q, you, do } | highest ForceP |



Next, subnumeration β is accessed and the matrix ForceP is built as seen in (97). At this point in the derivation two distinct trees exist in the derivational workspace, the subordinate clause and the matrix clause in (96) and (97) respectively.



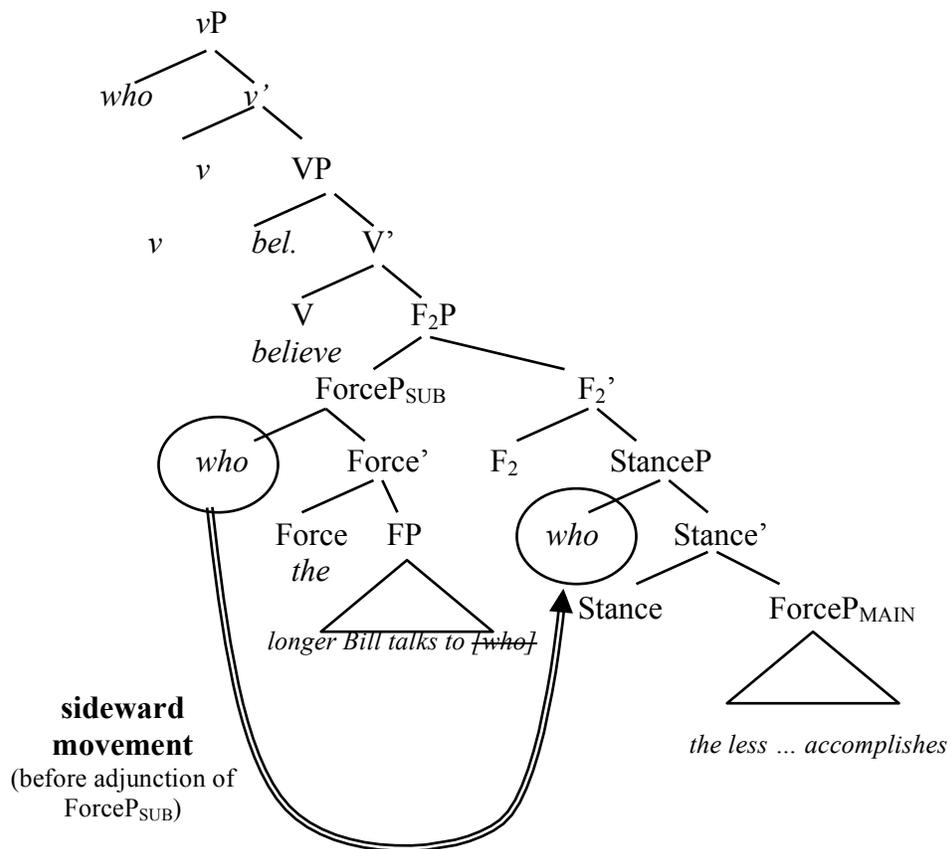
At this point in the derivation, there are items left in subnumeration β , Stance⁰ and F₂. Stance is part of the derivation and this subnumeration because the main verb of the expression, *believe*, is a Stance predicate. Since the subordinate clause is unadjoined to another tree, and since the *wh*-phrase is sitting at the edge of this tree, sideward movement of this *wh*-phrase is permitted. *Stance* is pulled from the subnumeration, and

merges with the matrix ForceP. After this merge, the *wh*-phrase *who* sideward moves from the subordinate ForceP, merging with the matrix clause and landing in SpecStanceP.

The last item from subnumeration β , F_2 , is pulled and merged with StanceP. The subordinate clause can now join to the main clause, giving us a single rooted tree in the derivational workspace.

Subnumeration γ is now accessed, the vP is built in a regular fashion, and the last step of this portion of the derivation is for *who* to move into Spec, vP . The tree structure in (98) shows the resulting structure. The last steps of the derivation are the building of the highest CP and the final movement of the *wh*-phrase to matrix Spec,CP.

(98)



4. Revisiting the Issue of CP-recursion

As we saw in the data presented in chapter II, there are two distinct instances of *that* which can appear in English comparative correlatives. Both imply that CP-recursion may be a necessary occurrence in comparative correlatives. I have considered neither one in my proposal yet. In this section, let me briefly address this data and the theoretical consequences for allowing such structures to be derived from the grammar.

- (99) The more time (**that**) we spend on this, the harder it is to finish
(100) Bill thinks (**that**) the more time we spend on this, the harder it is to finish

As discussed in chapter II, §3.2.3, the item *that* can occur linearly between the comparative constituent (*more time* in (99)) and the lower TP. If we assume that this item is the complementizer *that*, this could potentially constitute CP-recursion.

- (101) $_{CP/ForceP}$ [The $_{FP}$ [[$_{DegP}$ [more time] $_{CP/ForceP}$ [**that** $_{TP}$ [we spend $_{DegP}$ [~~more time~~] on this]]]]]]

I can wiggle my way out of this a bit in two ways. First, I could try to argue that this *that* is actually not a complementizer (or $Force^0$ as we have classified traditional C^0 s throughout this analysis). While such an enterprise is not something I shy away from (i.e., I have spent a great deal of energy demonstrating that *the* at the start of each comparative correlative's clauses is not a definite determiner), I see no justification for such a move in this case, aside from wanting to eliminate CP-recursion. The second possibility is to say it is technically *not* CP-recursion since the $Force^0$ *the* in the first clause always takes an FP as its complement, whose head would then, in turn, take the CP/ForceP complement of which *that* is the X^0 . Before I spend my energy any further on this instance of *that*, consider the expression above in (100).

In (100), the entire comparative correlative, a CP/ForceP with an overt C^0 /Force⁰, is embedded under the verb *thinks*, which takes a CP complement. It would be great if the hypothetical minimal pair below in (102)-(103) reflected reality. If a speaker could be found that had this grammar, we could say that *think* takes a CP/ForceP complement, the comparative correlative, as can be seen by its obligatory overt C^0 /Force⁰. Unfortunately, I can't find any speaker with this judgment.

(102) Bill thinks the more time we spend on this, the harder it is to finish

(103) *Bill thinks that the more time we spend on this, the harder it is to finish

And much worse than the last case of apparent CP-recursion, neither of my possibilities for resolving this seems plausible. The item *that* that follows *think* is a C^0 /Force⁰, and it definitely takes a CP/ForceP complement.

One possibility for its resolution would be to consider more types of functional projections in the CP domain. I have already adopted a Rizzi-like taxonomy which includes ForceP, TopP, FocP, and FinP. In addition to this, I have proposed that for the successful derivation of comparative correlatives there is an additional functional projection, FP, which hosts DegP in its Spec. StanceP has also been introduced here (though there may be a way to reduce this new X^0 to a feature on Fin⁰). But this kind of expansion is unlikely to help us with respect to distinguishing a category label for the Force⁰ *the* and the traditional complementizer *that*.

As it relates to the present issue, I propose the following in broad terms and leave a detailed analysis as a topic for future investigation: the C^0 /Force⁰ *the* and the C^0 /Force⁰ *that* are clearly not the same thing, though they may be classified taxonomically together in a syntactic category. The distinguishing features of these two lexical items are enough

to merit saying the sisterhood relation between one's X^0 and the other's maximal projection should not be a source of concern.

Let me use the term “complementizer” in scare quotes to emphasize that this category label should not be something the grammar necessarily worries about, but rather a term used for ease of theorizing and discussion.

More directly relevant to this proposal and the larger theoretical issues which will be addressed in the next chapter, *the* is exactly the kind of “complementizer” that should be readily accepted as the complement or selector for another “complementizer.” It has a rich set of unique semantic and syntactic features, ones which lead to very specific kinds of clauses. In a way, most of the quirkiness of comparative correlatives that has been noted previously can be explained if we have something like the complementizer *the* in the lexical inventory. I will use this conceptualization to springboard into the next chapter, the existence of a single lexical item being a construction of sorts, holding all the features and “building specifications” to derive entire expressions.

Chapter IV Constructions in the minimalist grammar, or not

1. Introduction

In the last chapter, we witnessed a derivation of comparative correlatives that placed a premium on adhering to endocentricity. This constraint, derived from the principle of bare phrase structure (Chomsky, 1995b) provided that analysis with the advantage of not requiring the use of any lexical primitives larger than individual heads. This analysis contrasted with previous analyses of the data in which phrasal and sentential constructions were not only used, the data were presented as prime examples as why such constructions must exist in a grammar. I take my argumentation in the previous chapter as a case study establishing that a minimalist grammar without constructions can account for the descriptive facts of language, both syntactic and semantic. This conclusion could be seen as premature, that I would need to deal with each and every piece of data used in support of constructions before I could establish such a conclusion. Point taken. I answer this objection by saying I took a difficult case, one that was taken to be the poster child of construction-specific grammars. If this case could be solved, I tentatively suggest that easier puzzles along the same lines could be solved in a similar fashion.

At this point, I could conclude the discussion of constructions as it relates to a theory of grammar that assumes the tenets of endocentricity (Chomsky, 1995b) and the Minimalist Program (Chomsky 1993, 1995a). If constructions are not necessary, it stands to reason that we should no longer consider them for inclusion in the grammar. Instead, we arrive here in this final chapter poised to consider a bigger question than whether constructions are essential to a grammatical system; I consider here whether

constructions can exist in any grammar that strives to address the goals of the Minimalist Program. In other words, if the cognitive faculty of language has the ability to learn, store, retrieve, parse, and produce a phrasal or sentential construction, does this happen, under minimalist assumptions? Is it possible that constructions are useful, though not needed? If so, is this desirable in a minimalist theory? Even if constructions are not needed or useful, what then? What does the Minimalist Program say to this?

The minimalist program does not present to the linguist what does or does not exist in a grammar. There are no modules, it is not a theory. Rather, it presents to the linguist the challenge to determine what the ideal grammar should be comprised of. In pursuit of this ideal, the past 20 years of research have witnessed many theoretical constructs proposed, adopted, argued over, dumped, reformulated, and repropounded. In light of this minimalist "challenge," I spend this chapter exploring whether phrasal and sentential constructions, "big" constructions, have any place in a minimalist theory of grammar.

Two brief points of clarification before I begin. First, I stated in chapter I of this thesis that nothing discussed here bears on whether a non-minimalist grammar is tenable. More specifically, the viability of a construction-based grammar that does NOT hold as one of its goals to pursue the ideals of minimalism is in no way jeopardized by what is discussed here; that conclusion does not follow logically from the premises. I leave such a consideration for those with more globally-minded theoretical concerns. Secondly, at times in this chapter it may seem as if I'm being redundant or ignoring a prior conclusion. For instance, in §3.2, I will review the central arguments in favor of constructions; these arguments assume that constructions are essential primitives in the grammatical system.

As I've explicated on above, the conclusion of the last chapter is that constructions are NOT essential to the grammatical system. But by reviewing these arguments, we must hold this idea to the side temporarily in order to get to our central goal – looking for evidence of constructions. I will do my best in these instances to flag the issue for the reader in order to keep the main flow of ideas clear.

This chapter is organized as follows: §2 provides an overview of the Minimalist Program and the assumptions which are directly relevant to the discussion of this chapter, §3 considers several possibilities in evidence for "big" constructions in natural language and in the grammatical system, §4 presents the exercise of determining that phrasal and/or sentential constructions cannot be notational variants of feature-rich heads, §5 moves onward in discussing the conceptual issues of constructions, specifically addressing the impact of Representational Economy on the existence of constructions, and §6 concludes.

2. Background review of the Minimalist Program for Language (Chomsky 1993, 1995a)

A theory of grammar needs, at the very least, to have descriptive and explanatory adequacy. Once a theory is well on its way to achieving these goals, the question arises of how well-grounded the theory is with respect to conceptual considerations. The end goal of this thesis has been to reach the point where such conceptual considerations can be discussed. As such, the analysis I presented in Chapter III set as a goal to adhere to tenets of minimalism. This section lays out some of the assumptions that analysis rested upon, as well as others that are relevant to the discussion of constructions as primitives in a minimalist grammatical system.

The Minimalist Program goes above and beyond considerations of descriptive and explanatory adequacy and places a premium upon pursuing theoretical adequacy. Linguists should ask, what conditions are imposed upon the language faculty due to virtual conceptual necessity and, beyond these conditions of virtual conceptual necessity, what more is needed for a fully-functional system of grammar (i.e., cognitive devices and constructs unique to Language)? In endeavoring to provide answers to these questions, one must consider issues of parsimony, elegance, and efficiency, and reducing redundancy where it exists. The Strong Minimalist Thesis (SMT) proposes that the system of Language consists only of general principles of cognition and of the principled part of the language faculty. In pursuing reduction of redundancy in the system, any part of Language that resembles a general principle of cognition should be assumed to be an instance of that general principle at work in the language faculty.⁴³ Following from this, the principles ideally should satisfy the requirement of “virtual conceptual necessity,” meaning that the cognitive device follows from general principles of computation. As Chomsky has written repeatedly, demonstrating that SMT is valid is highly unlikely. Yet, if we take satisfying SMT as the starting place of any theoretical inquiry, it compels us to resist ad hoc conjectures and devices unless there is no other alternative solution.

Moving to more specific assumptions of the minimalist theory I am considering, the primitives of the grammatical system are individual lexical entries, pairings of sound and meaning, in the formal form (π, λ) . This is a non-controversial assumption, one that

⁴³ In clarifying this further, Fitch, Hauser & Chomsky (2005) assert that the faculty of language in the narrow sense (FLN), meaning those cognitive principles that are unique to the language faculty, could possibly be empty. This illustrates the degree to which general cognitive principles are preferred over language-specific principles when seeking out what the grammar is comprised of.

has been integral to a theory of generative syntax since *LSLT* (Chomsky 1955, 1957). If idiosyncrasies exist in language (answer: they do), these idiosyncrasies must be encoded somewhere in the lexicon. If individual idiosyncrasies are not encoded on individual lexical items, we cannot even get past the question of why the word meaning “father” is pronounced [fa ðr] in English, but is [paI] in Portuguese. Without individual lexical entries for words and morphemes, we also cannot explain why, in English, *father* is a father and *mother* is a mother, and not the other way around.

Beyond the necessary semantic and phonological features that an individual lexical item holds, we must assume that each item possesses syntactic features, a.k.a., formal features. An example of a purely syntactic feature (as opposed to a semantic or phonetic feature which can drive syntactic operations) would be grammatical gender agreement. Formal features are not the only features that can drive syntactic operations; in fact, any feature can drive syntactic operations. For instance, grammatical number (e.g., singular, dual, plural) contributes semantic information, but has a syntactic requirement of agreement; this feature has been proposed to be part of the ϕ -features that drive verb raising. All features that are not purely semantic must be checked before a derivation reaches the C-I interface and all features that are not purely phonetic must be checked before a derivation reaches the A-P interface.

Thus, an individual lexical entry consists entirely and only of features, creating what I will henceforth refer to as a *feature matrix* or *feature bundle*.

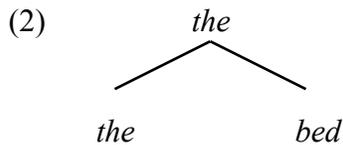
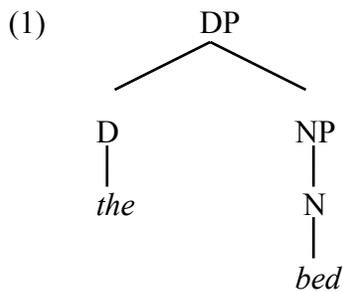
Following the proposals of Borer (1984), Chomsky (1995a), and most specifically Kayne (2005) in the form of microparameters, I assume that the “parameters” half of Principles & Parameters (Chomsky, 1981) is accounted for solely through features on

individual heads. This approach to feature bundles sets as its goal to account not just for contrasts across languages, but also for every minor contrast across languages and dialects. If, as part of a larger research program, it is demonstrated that microparametric variation can be accounted for by feature bundles on lexical items, this finding would eliminate the need for additional learning principles in the grammar, like the pro-drop parameter (Rizzi, 1980).

In addition to defining what objects are stored and retrieved in the lexicon, we must consider a method of combinatorics and to what extent this method satisfies the criteria of virtual conceptual necessity. We assume that two lexical items can undergo Merge and become one structure unit.⁴⁴ This unit now needs a label. In line with virtual conceptual necessity, I assume the theory of bare phrase structure (Chomsky, 1995b) which, among other things, demands that syntactic structure is endocentric. Bare phrase structure, in its simplest form, says, given α and β lexical items in the numeration of a derivation, when α and β Merge and become one object, $\{\alpha, \beta\}$, the label of that object will be either α or β . The other alternatives that Chomsky considers are that the label is (i) the intersection of α and β , and (ii) the union of α and β (Chomsky 1995b:397), both of which are ruled out immediately. The only other alternative is to give the object a label

⁴⁴ Since it is explicit in the analysis I proposed in Chapter III, I'll address movement, and more specifically sideward movement, here. The phenomenon of displacement is robust in language, though it does not follow from virtual conceptual necessity so far as I can tell. Regardless, a theory of language should provide an explanation for this phenomenon and, in line with minimalist goals, the simplest explanation. According to the copy theory of movement, the operation of Move (Internal Merge) is actually Copy + Merge. Once we adopt this idea, we accept that a moved constituent may exist in the computational workspace, at least briefly, unattached to a syntactic tree (i.e., Copy creates a new object that is not attached to anything else). If this notion is accepted, the simplest step forward is to say that an object in the workspace must undergo Merge as soon as possible. This step does not impose any condition on a singly-rooted tree in the workspace, since the operation of Copy already necessitated that such a step must exist.

distinct from either α or β , but to do so deviates from the standard of virtual conceptual necessity. To illustrate this with data, take the DP *the bed*. We are familiar with notating this DP as in (1) below.⁴⁵ Under a theory of bare phrase structure, *the bed* has the structure in (2).



In other words, if *the* and *bed* undergo the operation Merge and become one unit, the result is a binary branching tree with two daughters, and its label must be either *the* or *bed*. There is no renaming of intermediate nodes into category labels like N or D. The information that these labels provided in earlier incantations of generative syntactic theory is carried in features of individual heads.

This brief summary of my assumptions for a minimalist grammar is not meant to be exhaustive, but rather what is immediately relevant to the remainder of the discussion of this chapter. The inherent endocentricity of linguistic objects, a by-product of bare phrase structure, weakens the usefulness of constructions considerably. Since bare phrase

⁴⁵ If we were to assume X' theory applied to this object, both D and N would project a complete X' structure; as illustrated in (1), nothing occupies the specifier position in either phrase, so no intermediate X' level is illustrated in these XPs. In this way, the structure is more akin to phrase structure rules before X' theory.

structure is part of the language faculty via virtual conceptual necessity, a construction that violates this principle stands on shaky conceptual ground.

3. Trying to find empirical evidence for constructions

Following the assumptions about a minimalist grammar that we just reviewed, I'll take a brief step backward. I stepped through the derivation of comparative correlatives without using constructions, implying that because constructions do not meet the criteria of virtual conceptual necessity for this or any other data, constructions are not part of the grammar. But if we find empirical evidence for something in the grammar (like *do*-support or the contrast between *wh*-movement in matrix and embedded questions), this evidence needs to be accounted for whether or not the result is the "optimal" grammar. I have yet to examine the strongest arguments in favor of constructions to determine whether such empirical evidence exists. This section tries from several angles to find such evidence. I will give the section spoiler now: there is little to no evidence that constructions exist, which will lead us to our original deeper question: do constructions have any place in a minimalist grammar if they do not satisfy the criteria of virtual conceptual necessity? Still, let's go through the exercise and examine the strongest arguments in support of the existence of constructions in order to determine if we must account for this data to satisfy descriptive and explanatory adequacy.

In the literature review presented in chapter II, we were reminded over and over of a tenet of construction-based grammars: constructions cannot be eliminated from a model of natural language. The reasoning behind this tenet is that vital information about a sentence or phrase cannot be captured by the combination of the lexical items alone. In

this section, I will consider this tenet outside of the one case study of comparative correlatives.

3.1 The big arguments for “big” constructions

Independent of whether a theory is minimalist or not, there are two broad arguments that exist for the existence of “big” constructions. Both arguments have been used with respect to comparative correlatives, and both entail that a strictly compositional grammar will lack necessary information for an accurate interpretation of a given sentence. I will examine both in this subsection.

The first argument is that linguistic structure is not necessarily endocentric, that is, that the category label of a phrase or sentence need not be the same category of any individual lexical item in the constituent. If exocentric phrases exist, their existence would be a strong argument for the necessity of constructions in the grammar. This was arguably the strongest argument used in favor of constructions for comparative correlatives, used by Culicover & Jackendoff (1999, 2005), and Borsley (2003, 2004). Borsley (2003) explicitly states that the category of the entire comparative correlative construction cannot be endocentric (i.e., recall from Chapter II §4.1, fn 19 and 20, the Generalized Head Feature Principle and that the only vehicle to licit violation of that principle is an exocentric construction). My formal analysis of comparative correlatives in the last chapter demonstrates that it is not necessary or helpful to violate endocentricity in accounting for the various syntactic behaviors of the data. Inasmuch as comparative correlatives were taken to be a hard “nut” to crack for any minimalist approach, and that my minimalist proposal was endocentric, I see no need to build exceptions into the grammar on this issue.

The second argument for the necessity of “big” constructions is to account for the inherent polysemy in individual lexical items. The various semantic senses of a single lexical item require a syntactic frame in order to be correctly interpreted. In order to solve this problem, sentence-level constructions account for generalizations in meaning found in syntactic structures, for instance “Bill reads books” and “Bill throws books” both carry the meaning “x acts upon y” (x=Bill, y=books). If there are not sentence-level constructions (and, to some extent, phrase-level constructions too), the full semantic interpretation cannot obtain. Further, generalizations like the one we just saw with “x acts upon y” would be missed. The short answer to this argument from a minimalist standpoint is to point in the direction of feature matrices on individual heads. An individual lexical item can be pulled out of the lexicon and into a derivational numeration with semantic features that not only produce the correct semantic interpretation, but that also drive the derivation to build only the syntactic frame that would work with this interpretation. But let me take a step back and look at the reasoning in favor of constructions in accounting for these types of data. With respect to the flexibility of a single lexical item, I’ll take a look at a specific (and probably the most well-cited) example from the literature in support of constructions: the verb *roll*.

Goldberg (1995) gives several examples of the English verb *roll* to demonstrate the point that the various semantic senses of a single word are captured by way of the phrasal construction that word is framed inside. (3)-(5) below are a sample of some of the various senses of the verb.

- (3) Bill rolled
- (4) Bill rolled the ball
- (5) Bill rolled the ball off the table

In (3), the verb is intransitive and refers to an action that characterizes something Bill did with his own body. As part of the grammar, there is a sentential construction that is intransitive, consisting of a subject and an intransitive verb. Also included as part of this construction is the information that the syntactic subject has the characteristic of the action of the verb. The sense of the verb is different in (4); now the verb is transitive, an action of which Bill is the agent, and the agent is acting upon another object, the ball. Thus it is not Bill that had that characteristic action of rolling, it is the ball. We know from our knowledge of the language that many other similar verbs can be found in sentences like this, such as *move*, *push*, and *nudge*, so a more specific type of meaning can be built for the verb in this sentential construction which all these verbs hold in common. In (5), this sense changes again. The verb is still transitive and it still can be replaced with other verbs like *move*, *push* and *nudge*, but now the sentence also includes a locative prepositional phrase. The verb now describes a single event in the past of the agent Bill acting upon the object the ball and the agent's action caused the object to move to a specific location, namely off the table. Thus, in each of three sentences the verb *roll* has a different semantic sense. This difference is captured by use of a different sentential construction for each sentence.

Now consider (6) and (7).

- (6) Bill sneezed
- (7) Bill sneezed the handkerchief off the table

The sentential construction used for (3) is the same one used in (6). The sentence consists of a subject and an intransitive verb, and the subject has the characteristic of the action of the verb. And like we saw in the case of *roll*, the verb *sneeze* can be used in a transitive sentence like (7). Ordinarily the verb *sneeze* is interpreted intransitively, as we saw above

in (6). But if a sentential construction like one used for sentences like *Bill rolled the ball off the table* is available in the grammar, the verb *sneeze* can be used to mean “an action that an agent makes upon an object, moving that object to another place where the motion ends.”⁴⁶ The change in the sense of the verb is derived from the sentential construction then, not the verb itself. One cited benefit of a grammar that includes sentential constructions is that the use of these constructions enables unprecedented usages of lexical items to convey meaning that they don’t ordinarily have.

From the data we’ve seen so far, we might conclude that there is one sentential construction that is used in every intransitive sentence or only one sentential construction that is used in every transitive sentences. This would be far too simplistic. Consider (8).

(8) Bill liked the house

If we used the same transitive construction in (8) that was used in (4), we’d conclude that Bill is acting upon the house and causing motion. So we need a second transitive construction to capture the semantic sense of the verb *like* in (8), which presumably would also be used with *love* and *hate* when this particular meaning is desired. One might be tempted to say the transitive sentential construction has just not been stated abstractly enough to be used for the broad array of transitive sentences. It is certainly possible to state what a transitive sentence is in an abstract enough way to capture the commonalities of the sentences in both (4) and (8). But remember that the primary goal of including phrasal and sentential constructions in a grammar is because without these elements some

⁴⁶ Note, if we assume Θ -theory, this would be an unusual Θ -role to assign to the syntactic subject of *sneeze*. Sneezing is an action which, almost by definition, lacks any volition on the part of the sneezer. In this way, the syntactic subject would carry the theta role experiencer as opposed to the syntactic subject of *roll* in (4) or (5).

of the meaning of the sentence is lost. Such an abstraction would not serve the stated purpose of constructions with respect to this issue.

Now that we've examined exactly what semantic information constructions can account for, I return to whether this makes constructions vital to a given theory. Within minimalism and within construction-based grammars, each word in the grammar must have its own lexical entry and, at the very least, be a pairing of phonetic and semantic information. Given this ineliminable primitive, a theory within minimalism is that the individual unit carries this information in the form of features, the basis of the theory of feature checking. If we assume these basics of a grammar, it is a short step to say that an individual lexical item, like *roll*, could also bear different features when found in the three expressions in (3)-(5), these differences being what is minimally necessary to account for the difference in interpretation and different syntactic frame⁴⁷. I find this to be a natural extension of the most basic parts of a minimalist grammar (i.e., individual lexical entries for words and features on individual lexical items). As such, the data in (3)-(8) do not constitute an argument in favor of constructions as ineliminable.

Let us conclude at this intermediate point that constructions do not meet the requirement of virtual conceptual necessity, nor is there empirical evidence for constructions in natural language.

3.2 A wrench in the works – idioms

Before I make the hasty conclusion that everything in a given language works like a well-oiled machine by simply pulling out individual heads and combining them, and that a language has no need for any primitive with a phrasal or sentential structure in

⁴⁷ The feature(s) on *roll* that account for the difference in meaning and the feature(s) that account for the difference in syntactic frame may very well be the same feature(s).

order to arrive at the correct semantic interpretation, we have to consider idioms. They are defined as (i) having a semantic interpretation distinct from the literal sum of their parts and (ii) having the syntactic behavior of a phrasal or sentential constituent. A few from English are given below in (9)-(19).

- (9) the shit hit the fan
- (10) all hell breaks loose
- (11) shooting fish in a barrel
- (12) kick the bucket
- (13) let the cat out of the bag
- (14) throw a wrench in the works
- (15) get the monkey off your back
- (16) out of your league
- (17) above my pay grade
- (18) water under the bridge
- (19) a pain in the ass

We know idioms are stored as units in the lexicon because their idiomatic meaning could never be deduced in a compositional way. A compositional interpretation for any idiom is available, but, crucially, it is very different from the more common idiomatic meaning. We also know that idioms are qualitatively different than individual lexical items in this way: Idioms have structure and do not project structure. When an idiom enters a derivation, it has a phrase label. When it participates in the operation Merge, the resulting constituent is an extension of the label of the other sister. Put simply, when you pull an idiom chunk out of an array, you don't pull out a head and get a phrase, you pull out a phrase and that phrase has to merge with another head that will project its own category label.

Following from the conclusions in the last subsection, it would be ideal if we could show that idioms have a flat structure and demonstrate no behaviors that would

reveal internal structure. Unfortunately that's not what we observe. Idioms can be part of raising structures, as in (20)-(23).

- (20) a. it seems the shit has hit the fan
b. the shit seems to have hit the fan
- (21) a. it's likely the shit will hit the fan
b. The shit is likely to hit the fan.
- (22) a. it seems all hell has broken loose
b. all hell seems to have broken loose
- (23) a. it's likely all hell will break loose
b. all hell is likely to break loose

In light of this data, we are forced to conclude that idioms have internal syntactic structure and that once an idiom enters a derivation, its individual heads can participate in syntactic operations, leading us to conclude that these heads have feature matrices of their own. It sure seems that however we define a phrasal or sentential construction, it will be difficult to distinguish it from an idiom. Further, if idiom chunks exist in Language, they stand as evidence that the language faculty has the ability to learn, store, retrieve, parse, and produce constructions.

There are three characteristics of idioms which distinguish them from constructions. Firstly, phrasal and sentential constructions have, by definition, variable terminal nodes. If they did not, constructions would necessarily be a laundry list of every possible phrase and sentence that a language contained, hardly a system. Idioms, with the rare exception of instances like *take X to the cleaners*,⁴⁸ require that every terminal node

⁴⁸ Examples of idioms that arguably include variables in terminal nodes are

- (i) a. like father like son
b. like mother like daughter
c. like advisor like student
- (ii) let he who is without sin cast the first stone

be filled as part of the lexical entry. If one utters, “*that was as easy as killing fish in a bucket!*”, he will most likely elicit giggles rather than be championed for his cleverness. This is a critical distinction between idioms and constructions with respect to the ramifications for the computational system. Variables in the terminal nodes that must be filled require the grammar to have an operation of lexical insertion. Such an operation need not exist if constructions are not part of the grammar and idioms are.

Secondly, idioms clearly hold a semantic meaning which cannot be derived compositionally. As I explored in the immediately prior subsection §3.1 with the verb *roll*, combining individual lexical items with rich feature matrices yields phrases and sentences that retain all the necessary information for accurate interpretation, in contrast to what we see with idioms. On these grounds, idioms are required to be stored individually; other phrase types and sentence types are not.

The last argument that idioms are qualitatively different from constructions is that idioms are endocentric. Take the idiom in (11), *shooting fish in a barrel*. Its semantic interpretation can be paraphrased roughly as, “easy” or “simple.” We could say this is evidence that its category label should be AdjP, violating endocentricity. But note, the

(iii) take X to the cleaners

The variable in each of these idioms is different. In (i), as long as the relationship between the first entity and the second is of the same kinship relationship, the idiomatic meaning is preserved, as seen by (i)c. Thus the terminal node in this idiom is something like “X an individual, Y an individual in the correct kinship relationship with X.” Less troublesome is (ii), where the semantic interpretation includes quantification of the sort, “for any x, x a person without sin, let x cast the first stone.” In (iii), the internal argument of the predicate can be filled with any +animate individual, whether that be *Bill* or *the MSU women’s basketball team*. The issue of how to deal with these variables within an idiomatic unit could potentially be a second thesis in and of itself. As it relates to constructions which necessitate variables in terminal nodes, I leave the contrast as it stands. Idioms do not require variable terminal nodes yet apparently permit them in a limited sense; constructions are defined by having variable terminal nodes.

idiom cannot exist in syntactic environments where other adjectives are permitted. (25)-(26) are the relevant examples needed. The idiom cannot modify a noun within a DP (24) and it cannot be the predicate in a copular construction (25). If we want the idiom to predicate the subject in a copular construction, the word *like* needs to appear in the sentence, as the sentences in (26) demonstrate. This is what we would expect for a non-idiomatic VP in such a syntactic environment, as seen in (27).

- (24) a. Sally finished the easy/simple task before morning tea
 b. *Sally finished the shooting fish in a barrel task before morning tea
- (25) a. That test was (so) easy/simple
 b. *That test was (so) shooting fish in a barrel
- (26) a. That job was easy
 b. *That job was shooting fish in a barrel
 c. That job was like shooting fish in a barrel
- (27) a. That job was so easy, it was like shooting fish in a barrel
 b. That job was so easy, it was like tying my shoes

The same principle can be demonstrated for idioms of other categories. *A pain in the ass*, syntactically a DP, behaves like a *tough*-predicate, as seen in (28). Despite this superficial resemblance to an Adj, the DP idiom does not syntactically behave like an Adj. The idiom is a DP, though, as shown in (29)-(30). The Adj *difficult* can be modified by the degree morpheme *so*, and not *such*. The idiomatic DP *a pain in the ass* does just the reverse – it can be modified by the degree morpheme *such*, and not *so*.

- (28) a. John is difficult to talk to
 b. John is a pain in the ass to talk to
- (29) a. John is so difficult to talk to
 b. *John is so a pain in the ass to talk to
- (30) a. *John is such difficult to talk to
 b. John is such a pain in the ass to talk to

Insomuch as one of the “big” arguments for “big” constructions was to account for exocentricity in linguistic structure, idioms do not provide a use for such a capability of constructions.

Taken together, these three characteristics of idioms distinguish them from constructions. Thus, the existence of idioms in the language does not provide empirical evidence for constructions. Further, if idioms stand as the only empirical evidence for constructions in the grammar, we want idioms to be a strong, defining characteristic of human language, so strong that if we found a language lacking idioms, we would be forced to conclude that the language is deficient. Though idioms are common in natural language, they don’t hold the distinction of being a defining characteristic of Language.

3.3 Section conclusion

Before leaving this subsection, I want to highlight one claim I included in the above subsection: “if idiom chunks exist in Language, they stand as evidence that the language faculty has the ability to learn, store, retrieve, parse, and produce constructions.” It is not that the language faculty must have constructions, it is not that we have found empirical evidence that constructions are part of the language faculty, it is that the language faculty *has the ability* for constructions to exist within the system. Because the language faculty has this capability, I will continue considering whether or not they have any place in a minimalist grammar.

4. Notational variants: Heads vs. constructions

Thus far, I have been presenting argumentation for or against the existence of constructions in a grammar, assuming there is a noteworthy distinction between constructions and individual heads. Of course they are different: a “big” construction is a

structured phrase or sentence and an individual head is a lexical item. But I have presented lexical items as having a feature matrix filed with structure-building information. There is one possibility that I have not considered thus far: individual lexical items with rich features constitute a notational variant of constructions. If we are dealing with a case of notational variation, individual lexical heads would represent “constructions” in the grammatical system and there is no need to continue questioning whether constructions exist. This section addresses this issue directly. I’ll approach this by considering three specific items in the English lexicon: *under*, *because*, and our old friend, the comparative correlative’s *the*.

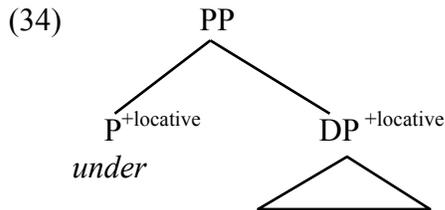
Regarding syntactic structure, prepositions tend to be fairly predictable in their syntactic behavior in English; they appear first linearly in the PP they head, immediately followed by a DP, as in (31)-(33).

- (31) The dog is PP[*under the table*]
- (32) Justin was successful PP[*in Denver*]
- (33) Justin was successful PP[*in his endeavor*]

I use the preposition *in* for both of these examples in (32) and (33) in order to focus on the contrastive semantic interpretation of the same lexical item. The single lexical item *in*, a preposition in both expressions, contains different features, similar to what we witnessed for the verb *roll* in (3)-(5). Like was the case for *roll*, I propose that the contrast noted is accounted for in the contrast between the feature matrices of the lexical item *in* available at the start of the derivations of these two distinct expressions.

Let’s focus our attention toward the preposition *under* in (31) now. As I just explained, its syntactic behavior is fairly predictable in English due to its status as a preposition. It appears first linearly in the PP it heads and is immediately followed by a

DP. So *under* holds a feature, let's say +locative, which only appears elsewhere in the grammar on a D. In this way, the feature requires that *under* take a DP complement. The operation of Merge used on these two items creates the structure in (34) below.



Given the assumptions I have just laid out, the features of *under* alone demand this structure be built, assuming a theory of feature-checking. For all intents and purposes, (34) looks like a phrasal construction. At the very least, it holds all the same structure-building information and semantic information that an *under-PP* construction holds.

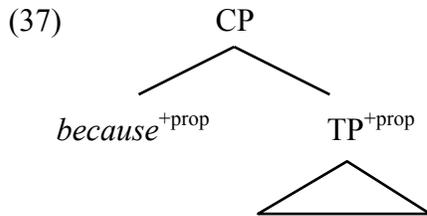
If we consider another syntactic category of lexical item, things may be more complex, though. Let's consider the complementizer *because*.⁴⁹ *Because* requires a propositional complement, a TP. The phrase headed by *because* is normally construed as an adverbial, the potential answer to the *wh*-word *why*.⁵⁰ As an adverbial, the *because*-clause can occur in sentence-initial or sentence-final position, as in (35)-(36).

(35) The dog is under the table *because* it is raining outside

(36) *Because* Frank went to Denver, he was successful

⁴⁹ Another possibility is that *because* is an adverb. As such, it would follow that the phrase it heads is interpreted as an adverbial. For the purposes of discussion here, this detail would not change the conclusion. If *because* is an Adv^0 , the features of which reliably build a *because-AdvP* identical to one that a phrasal construction builds, then it behaves in the same way with respect to notation that I spell out in this paragraph.

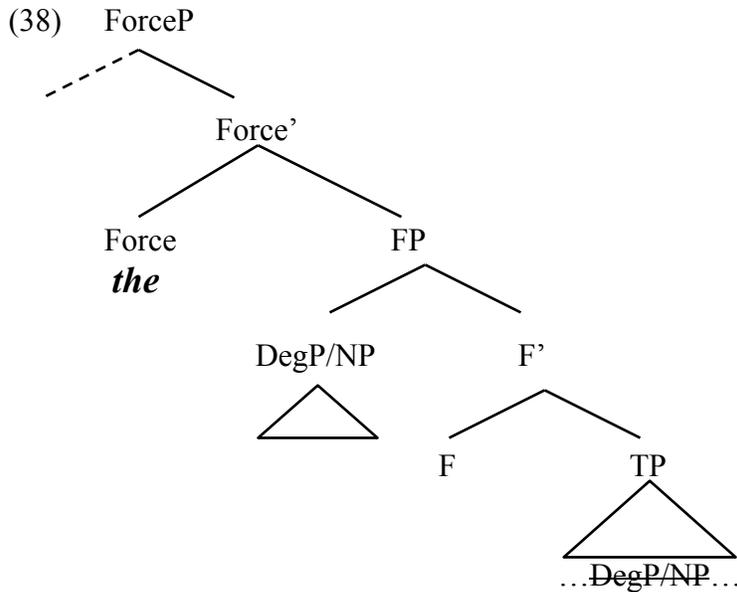
⁵⁰ Regarding the position of the *because*-clause, it can move more or less freely within the expression. In (35), it follows the main verbal clause; in (36), the phrase has been preposed to the front of the expression. This behavior can be accounted for by the feature matrix of *because*, as a result of a focus feature.



In a similar fashion to what we just witnessed with the preposition *under*, the complementizer *because* holds features that force it to build, within the course of a derivation, what looks like a phrasal construction, as in (37).

Thus far, it appears that feature-rich individual heads and phrasal constructions are notational variants. In shifting information from phrasal and sentential constructions to feature matrices on individual lexical items, the result appears to be very powerful lexical items, with all the information necessary to build the structure of whole phrases. In a sense, these individual lexical items are tiny phrasal “constructions,” in that they reliably grow the same structure each time they enter a derivation. How far can this idea be pushed? Is it possible that a single lexical item holds enough information in its feature matrix that it would result in the structure required for an entire sentence? If there were a candidate for building an entire sentence, it would have to be something like a main clause verb or complementizer. I’ll skip the exercise of the verbal domain and go right to a main clause complementizer since we have one that is fresh in our minds – comparative correlative’s *the*.

Drawing from the previous chapter, I proposed that the structure of the CP-domain surrounding the complementizer *the* is as seen in (38) below.



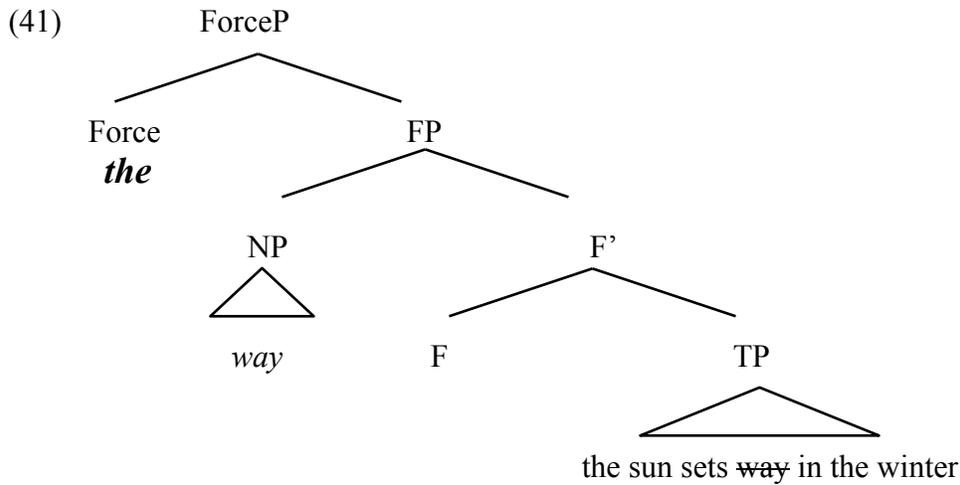
I proposed that this structure is reliably built when the necessary lexical items needed for a comparative correlative are selected for the arrays of the derivation. The relevant question I am exploring right now is whether the entire structure is built as a result of satisfying the features of *the*. The answer to that question is resoundingly “no,” as I will explain immediately.

In the previous chapter, I presented the cases of Nominal Extraposition (NE) which I argued also obligatorily contain the complementizer *the*:

- (39) It’s perfect [**the** way the sun sets in the winter]
 (40) It’s amazing [**the** people you see here these days]

Without going into a detailed analysis of these expressions, I argued that the bracketed constituent in (39) and (40) is a CP, headed by the complementizer *the* and satisfying the semantic requirements of the immediately preceding predicate, *perfect* and *amazing* in these specific examples. However, aside from labeling it a CP, the apparent similarity of the NE’s structure and the comparative correlative’s structure ends. Yes, movement from a lower position in the CP to immediately following *the* occurs in both types of

expression. But comparative correlatives have an obligatory DegP somewhere in the specifier position of FP, the complement of *the*; NEs have no such DegP. Instead, NEs have what looks exactly like a relative clause, except that the clause is in a position where a DP cannot occur. I propose that these differences are accounted for primarily by the other lexical items in the array and the features they contribute to the derivation. Let's look more closely at NEs. I propose the structure⁵¹ for the *the*-clause in (39) is as seen in (41).



Except for the lack of a degree element in SpecFP and the lack of an optional specifier of Force⁰, the structure in (41) now looks very similar to what we saw in comparative correlatives in (38). This similarity is due not just to the head *the*, but also the features of the head F whose maximal projection *the* takes as a complement. The constituent that moves to SpecFP (*way* in (41)) checks features with F, and it is the features of F that allow it to Merge with TP and take this TP as its complement. I propose that *the* and F

⁵¹ The movement of *way* to SpecFP appears obligatory because it is ungrammatical in the position where it is construed. If different items were available in the array of the derivation, we could imagine a TP like *the sun sets (in) this way in the winter*. I will assume this is the case and leave a more detailed treatment of these expressions for another project.

check a common feature, one that is unique to these two lexical items, yielding the structure common to both comparative correlatives and to NEs. In this way, neither lexical item contains the complete information to derive the entire CP, much less the entire expression, be it comparative correlative or NE. To be clear, it is the conspiracy of two lexical items that must occur together in an array in order to derive this similar structure. Further, it may very well be the case that one of these lexical items, *the* or F, appears elsewhere in the language without the other. In such expressions, we would predict a different structure from either (38) or (41).⁵²

The feature matrices of some lexical items, like *under* and *because*, have enough information to build what looks like familiar phrasal or sentential constructions proposed in construction grammars. We could conceive of these specific lexical items as “constructions,” inasmuch as they contain all the information that a phrasal construction provides to a construction grammar. But clearly it is not the case that every lexical item has a feature matrix that can accomplish this. Further, it is unclear that any lexical item has the power to build a “construction” larger than a phrase. The most likely candidates are verbs and complementizers, and the brief exercise I presented in this subsection

⁵² There are a few details about the complementizer *the* that become clearer now that we have probed further into its different uses in the language. First, comparative correlatives might lead us to believe that *the* must co-occur with a partner *the* (the first in the subordinate clause, the second in the main clause) in order to satisfy some semantic or syntactic requirement. The existence of Inverted Comparative Correlatives (i) already called such an idea into question, but NEs make it an untenable proposal.

- (i) Justin is more successful the longer he remains in Denver

Secondly, the complementizer *the* is not inherently linked to a degree interpretation. In NEs, it would be a stretch to suggest such an idea, leading us to conclude that the interpretation of degree in every comparative correlative is contributed by the Deg⁰ and or entire DegP, not *the*.

showed that comparative correlative's *the* actually has far less structure-building power derived from its features than we would initially suspect. With respect to the verbal domain, prior research and investigation into the verbal domain is extensive, giving us a good idea of how much structure-building power a single verbal head can have. From this prior research, we know that we cannot definitively determine from a single verbal head whether the expression being derived is interrogative or declarative, whether the verb is in an embedded or subordinate or main clause, or whether the entire expression will be of a specific type, like a conditional or a comparative. Indeed, it is not clear that the feature matrix of a single verbal head can even build a ditransitive verbal domain without merging with other lexical heads, introducing new features into the structure.

All this leads to the answer to our question about notational variation.

Constructions and feature-rich lexical items are not notational variants of one another. If constructions are part of a grammar, they exist in addition to the ineliminable individual lexical entries for each and every word in a given language.

5. The Conceptual Issue of Constructions

Our attempt to find evidence for including constructions in the grammar has thus far left us without a compelling reason to do so. There is no empirical data that forces us to conclude that constructions exist. Yet, in examining idioms, I asserted that the presence of idioms might be enough to establish that we could get constructions “for free,” meaning that we would need to postulate no additional principles or operations in order to include them in the grammar. I leave to the side my concern about an additional lexical insertion operation which would necessarily be part of the grammar in order to deal with the variables in terminal nodes of constructions. It is a legitimate concern, one

that might be enough to merit sidelining constructions, but I want to make a stronger argument for keeping the grammar construction-free. Regarding the conceptual issues that arise in adding primitives like constructions into the grammar, even if constructions come “for free,” I argue here that their presence in the grammar would make it less efficient, violating the principle of Economy. Additionally, even if constructions are completely endocentric, the mere presence of constructions in the grammar compromises bare phrase structure.

The possibility that constructions exist in a grammar relates directly to considerations of substantive economy, more specifically representational economy. Representational economy concerns the qualities of linguistic objects and whether an object is optimal. A familiar assumption typifying representational economy is Full Interpretation, that everything that enters the derivation is essential and everything that enters the derivation with interpretative import reaches an interface and is interpreted. In considering constructions, we are introducing an object into the lexicon that already has syntactic structure, not just the potential to build syntactic structure within the course of a derivation. The task is to determine whether such an object brings the grammar to a more optimal state.

In this section, I will first address a possibility that constructions could come “for free” as a by-product of a general cognitive principle. As promising as that idea is, I will then directly address the problematic issues of constructions in the ideal grammar: redundancy and unnecessary optionality. What we will conclude is that, even if the language faculty can get constructions “for free,” the grammar doesn’t include

constructions because a construction-filled grammar is a less optimal system than a construction-free grammar.

5.1 Constructions as an example of Chunking (Miller, 1956)

As I reviewed in §2, the Minimalist Program concerns itself with theoretical adequacy, the degree to which the system proposed is optimal. The conclusion that a grammar does not need constructions to achieve descriptive and explanatory adequacy still leaves open the question of whether constructions are conceptually desirable or, in fact, make a grammar more computationally efficient. The SMT asserts that the ideal system of grammar would contain no computational devices that are specialized for the language faculty. Following from this basis, finding evidence of general cognitive processes within the linguistic system is desired.

Let us consider the robust phenomena of chunking (Miller, 1956), in which individuals group together units in order to expand the memory capacity. Given a series of random tokens (numbers, words, letters) in a free recall task, an average individual can recall seven items (plus or minus two) without appealing to any special processes. However, if an individual can group a few tokens together, and possibly making them more unit-like by assigning a meaning to the group, the number of tokens recalled in the task dramatically improves. For instance, one individual assigned running times to sequences of digits, grouping together 4-7 digits into one meaningful unit, and was eventually able to recall more than 70 random digits in a short term memory free recall task (Ericsson, Chase & Faloon, 1980).⁵³ If an individual is permitted more exposure to

⁵³ A more common every day activity demonstrating chunking is quick memorization of telephone numbers. Once upon a time, people were actually required to enter numbers into a phone to place a call. If you didn't have a way of jotting down the number of

the same set of tokens and utilizes chunking, the cognitive device becomes useful in long term memory, as well. Imagine that such a cognitive process is available to the grammar. We have already established that the grammar must have a lexicon full of all the individual lexical heads of a given language. It is reasonable to say that the derivational process results in a random group of these items becoming grouped together in a larger, meaningful unit. This larger unit could then be stored and used again later. As such, a construction would constitute evidence for a more general cognitive process at work in Language. This is not to imply that, because constructions would constitute evidence for a general cognitive process, therefore constructions must be a part of the grammar. It is just to say that proposing such a process for the system of grammar is not ad hoc as it concerns general cognitive processes.

5.2 Redundancy

5.2.1 Constructions necessarily entail redundant information in the lexicon

At the start of chapter II, I provided a broad overview of what constructions are in theories of grammar that assume constructions. Depending on the specific theoretical framework, this can vary considerably. A construction can be as complex as a set-theoretic, hierarchical syntactic tree with rich information matrices in each node (i.e., HPSG) or as simple as a string of acoustic noises that has statistical regularity in natural language (i.e., Goldberg, 1995, 2006). Additionally, some of the specific assumptions and

someone you had just met on the street, you'd need a cognitive device that would reliably result in correctly recalling the number later, something that could expand your memory capacity. At this same point in the past, 10-digit numbers were comprised of three units, an area code that you could assign to a large location, the next three numbers which were also representative of a smaller neighborhood and usually familiar, and then four random digits in the end. If you could chunk the first three into one unit, and then chunk the second three into one unit, then you could probably remember the last four and reconnect with the person you met on Washington between Thayer and Fletcher later that weekend.

apparatus used in HPSG would be rejected under a cognitive linguistics framework (Goldberg, 1995; Lakoff, 1977), and vice versa. The question is, is there a commonality in the definition of "construction" across these frameworks? More specifically, is there a commonality among phrasal and sentential constructions across these frameworks? And even more specifically, is there a commonality among phrasal and sentential constructions across these frameworks which collectively distinguishes them from a theory resting on the tenets of the Minimalist Program (Chomsky, 1993, 1995a)? I assert that the answer to all these questions is yes. The commonality is redundancy in any construction grammar in this way: individual morphemes and words must be learned and stored as individual units in the grammar. Additionally, some of these individual morphemes and words are unique to certain phrases and sentences, meaning a specific morpheme appears in a specific syntactic context in the language and no other morpheme can exist in that context. As such, a construction defining that context (i.e., a phrasal or sentential construction) would include the requirement for that morpheme, and the existence of the morpheme as an additional unit in the grammar itself is unnecessary and redundant information in the grammar.

To illustrate, consider the English word *than*. We are most familiar with *than* appearing in comparative sentences as in (42), appearing immediately following the comparative and the constituent it modifies (i.e., *more + apples* in (42)). Other than this, *than* can form a constituent with *other* or *rather*, as in (43) and (44).

- (42) Tom has more apples *than* Joe (does)
- (43) *Other than* the position you currently hold, how many different positions have you held at this firm?
- (44) I prefer to eat blueberries *rather than* pick them

Because of these multiple uses in the grammar, and assuming that the semantic and phonetic features of this word are identical across these different uses in the language, *than* requires its own lexical entry, regardless of the existence of constructions in the grammar. This word/morpheme entry holds semantic and phonetic information about *than*, and also holds syntactic information, like the word's syntactic category or the syntactic environment the word can exist in. If the individual word lacked syntactic information, every phrasal and sentential construction which is able to use the word *than* would be required to contain the specification that this word would appear within it. Further, if the word-level entry is not part of the grammar (i.e., there is no lexical entry for the word *than*), larger constructions would also need to specify all the lexical information for the word *than*. This comes dangerously close to a lexical entry for every individual phrase and every individual sentence, a notion far afield from the optimal solution.

Continuing with the specific case of *than*, we will need more than the individual word-level lexical entry within the grammar. In order for *than* to appear in a comparative sentence, the grammar will need a phrasal construction that defines what we will call the *than*-phrase (i.e., *than Joe (does)* in (42)). This phrasal construction will define itself as obligatorily starting with the item *than*. The grammar also will need a sentential construction which defines a comparative sentence, the last phrase of which will be the *than*-phrase. Regarding the phrase-initial position of the complement of a comparative, the word *than* obligatorily must fill this position (i.e., there is no other linguistic item in the language that can or may).

In the case of *than* then, even though the phrasal and sentential constructions necessary to build a comparative like (42) specify that the word *than* must be included, we don't have enough information in these larger constructions about the word *than*. The grammar also must include an entry for the word *than* itself. Even if we eliminated one of the constructions, like proposing that only the *than*-phrase is in the lexicon and there is no sentential comparative construction, the system would still contain redundancies.

5.2.2 How much is “too much” to store in the lexicon

Beyond literal redundancy of lexical information in the grammar, there is a question of efficient computation with respect to optimizing how much is stored in the lexicon. Taking the example of *than*, it is unclear that I have gained anything computationally by adding a *than*-phrase construction to the grammar, much less a comparative construction. Using these three items for computation, the individual still has to access all the individual lexical items in the sentence and correctly slot each of these items into the structure and, in many cases, build structure to fill in the missing parts of the phrasal and sentential construction. With these big constructions in the works, though, two new items are in the lexicon. We like to think of the mind's capacity for storage and retrieval speed as unbounded for practical purposes. This may be so, but glutting up the system with inessential, redundant items is not the optimal solution. It doesn't matter how powerful and capable the mind is, nor whether constructions *could* be used by the grammar. What matters in seeking theoretical adequacy is the principles of economy and whether extra, redundant items in the lexicon lead us to the optimal grammar.

5.3 The problem of choosing a system

There is a larger issue relevant to economy that I alluded to in the last subsection. Introducing constructions into the grammar gives the individual two options for deriving any expression. We have already established that strict compositionality can account for all the expressions in a given language and that no information is lost in this type of grammar. If constructions are part of the grammar as well, there are two possible ways that any phrase or sentence could be derived: with or without the use of constructions. This is qualitatively different than comparing two derivations with the same numerations and same final state; this is two competing grammars available at every turn. From the get-go of derivation, there is an option of whether one or more constructions are part of the numeration. Such an optionality does not lead to computational efficiency; it leads to just the opposite, in fact.

5.4 Sacrificing bare phrase structure

As a last note regarding constructions in a minimalist grammar, we reviewed the principle of bare phrase structure in §2 of this chapter, a principle that is generally accepted as part of a minimalist grammar because it follows from considerations of virtual conceptual necessity. If constructions are part of the grammar, this principle is in jeopardy.

If linguistic objects respect bare phrase structure, the non-terminal nodes in a structure cannot be determined without information from the terminal nodes. This means that the uppermost label of a comparative correlative is *the*, not CP or any other label. This may not seem so problematic for constructions, we could just imagine the sentential construction for comparative correlatives bearing a label *the* since it will be the case for

every comparative correlative in English. But what about other “big” constructions? The examples in §3.1 used in support of constructions are repeated here to illustrate the problem more clearly.

- (45) Bill reads books
- (46) Bill throws books

As the reader will recall, the sentences in (45)-(46) were used to show a generalization in the semantic interpretation of the sentence-type, namely “x acts upon y.” The value of this construction to a grammar is that the single construction in the lexicon can account for the commonality in the two sentences without burdening the individual lexical items with this information. But in light of bare phrase structure, we now can ask the question, what is this object outside of the semantic information it provides? The sentence in (45) is a *reads*-construction; the sentence in (46) is a *throws*-construction. So either they are two different objects stored in the lexicon or they are the same object with no labels. We have already seen in this chapter that the terminal nodes must be left open for some operation of lexical insertion. And it follows from bare phrase structure that the information in the non-terminal nodes is determined by the terminal nodes themselves. If a construction doesn’t have information in the terminal nor non-terminal nodes, what information can it have? Arguably the answer is, “none.”

5.5 Section conclusion

The conceptual considerations we witnessed in this section were the last attempt to justify a way to include constructions in a minimalist grammar. Though we might be able to make the tentative case that constructions come “for free” via the general cognitive principle of chunking, the system would be become less optimal as a result of

their presence. This is the wrong direction to go in building a minimalist theory. As a result, I conclude that constructions have no place in a minimalist theory of Language.

6. Conclusion

In line with the goals of the Minimalist Program, this final chapter represents an exercise of investigating whether phrasal and sentential constructions have any place in a minimalist theory. In each of the considerations and tests in this chapter, I approached the question objectively, trying to discover whether constructions aided my theory in becoming more efficient, more parsimonious, or more elegant. What I have concluded is not only that constructions don't make for a conceptually superior theory, their presence in the grammar actually leads to a less efficient and redundant system. In the worst case scenario, bare phrase structure rules them out completely as objects that cannot be defined.

Thus I have left this exercise in largely the same place where minimalist theories stood before I began – concluding that constructions do not have a place in a theory that sets as its goal to achieve theoretical adequacy. This is what the Minimalist Program requires us to do in order to arrive at our goal of developing a model of the optimal system.

Appendix

Explanation of questionnaire referenced in chapter II, §3.2.3

1. Introduction

Traditionally, collecting natural language data includes sitting with native speakers (informants) of a language and asking for examples while that information is documented. Once a base set of data is formed and the linguist begins to understand how the language works, new sentences can be generated and the informant can judge those sentences as acceptable or unacceptable. This simple interview process can create an enormous amount of information. In the course of my data-gathering on comparative correlatives, I discovered that speakers would second-guess their judgments regarding the word *that* optionally occurring between the compared phrase and the lower TP (see (1) immediately below).

(1) The more apples (that) John picked, the more pies (that) his mother baked

In order to overcome this obstacle, I devised a questionnaire for speakers to complete.

The questionnaire consisted of 2 sections. Informants were asked to read the instructions on the questionnaire and complete the questionnaire given these instructions. First, 12 baseline sentences were presented and the informant was asked to indicate if a “sentence is a ‘bad’ English sentence (it sounds like something a non-native English speaker would say).” They were also given the option to mark a sentence with a question mark if they were unsure whether they thought it was good or bad. The directions on this first section were:

“I am interested in how you as an individual judge these sentences as acceptable or not in English. For all of these sentences, report your judgment based on how you speak, not on how someone else might tell you they think you should speak.

“For (1)-(12), all you have to do is indicate whether the sentence is a ‘bad’ English sentence (it sounds like something a non-native English speaker would say). If it is bad, note that with a star, ‘*’. If you are not sure whether you think a sentence is good or bad, just put a question mark (?) next to it.”

These baseline sentences were simple comparative correlatives with no *that* in either clause, such as (2). The baseline sentences varied in what kinds of phrases were being modified by the comparative: VP, NP, AdjP, and AdvP.

(2) The more apples John picked, the more pies his mother baked

This first section served two purposes – 1) to ensure that the test items based on these sentences that appear later in the questionnaire were contrasting an acceptable sentence to another, and 2) to ensure that informants considered comparative correlatives generally acceptable in their own grammar.

In the second portion, the informant was presented with 61 pairs of sentences and asked to judge whether the second was worse, better or the same as the first. Again, the directions that were written were:

“For each of the sentences below, two tasks need to be completed:

1. For each pair of sentences, indicate whether the B sentence is worse, better or the same as the A sentence by **bolding** or circling the appropriate answer, ‘worse than,’ ‘better than’ or ‘about the same as.’ **Remember, you are judging how B compares to A. An answer of ‘worse than’ means ‘B is worse than A.’**
2. For each sentence, if you feel it is a ‘bad’ English sentence (it sounds like something a non-native speaker would say), note that with a star, ‘*’. If you are not sure whether you think a sentence is good or bad, just put a question mark (?) next to it. **You do not have to put a mark next to every sentence; you only need to mark a sentence if you think it is bad or if you are unsure about whether it is good or bad. Sentences that you find normal (i.e., you could use them in your own speech) do not need to be marked in any way.”**

The 61 pairs consisted of 33 test items randomly mixed with 28 fillers. The 33 test items were based on the first 11 baseline sentences. From each of the 11 baseline sentences,

three test sentences were constructed – one with *that* in the first clause, one with *that* in the second clause, and one with *that* in both clauses. One example is below in (2).

- (3) a. The more apples John picked, the more pies his mother baked.
b. The more apples John picked, the more pies that his mother baked.

B is worse than
better than A
about the same as

(3)a was presented to the informant in the first section as another item number.

Informants were asked to indicate for any sentence in the second section whether they considered it something a non-native speaker would say, or if they were unsure whether it was something they would say. If no notation was made, this meant that an informant considered the sentence something that they would say. To ensure that informants were not just skipping this step, clearly unacceptable fillers were randomly distributed throughout the questionnaire. All informants marked these control fillers as “*”.

Therefore, in this questionnaire, informants were forced to judge all sentences in one of three ways:

1. acceptable (a sentence they would say)
2. unacceptable (a sentence they would not say and that sounded non-native)
3. unsure (they could not decide whether they would say it, or whether it sounded like something a non-native speaker would say)

1.1 Informants

A total of seven informants completed the questionnaire. All considered themselves to be native monolingual speakers of American English. None of the seven informants had previously been questioned about the data. Informants varied with respect to age, gender, location of childhood, and linguistic environment. Additional information is in Table A1 below:

Table A1

Informant	#1	#2	#3	#4	#5	#6	#7
Age	63	57	33	34	41	32	32
Gender	F	F	F	M	F	F	F
Childhood home locale	Rural Ohio	Rural Ohio	Rural Georgia	Urban Georgia (Atlanta)	Urban Maryland (DC)	Urban Florida (Ft. Lauderdale)	Urban California (San Diego)
Ling environment?	Only English	Only English	Only English	Only English	M – native Telagu, fluent English F- native Tamil, fluent English	M- Only English, F- native Mandarin, fluent English	Only English

Of these seven, the data from one informant was dropped because he judged seven of 11 control sentences as non-native or possibly non-native. This was taken to indicate that this speaker did not regularly use comparative correlatives in his own speech, or generally to consider them acceptable in English. To this point, the speaker is a professional journalist, trained at one of the top journalism schools in the United States (Medill School of Journalism at Northwestern University). It is likely that this factor interfered with his ability to access more natural speech judgments in favor of prescriptivist conventions he uses every day as a professional. This is especially true given that this questionnaire was given in written format instead of given orally, the way grammaticality judgments have traditionally been collected.

In post-questionnaire interviews, informants reported that they did not detect what the test items were designed to discover.

1.2 Test items

The data for the test items is based on judgments from the remaining six informants. Of the 11 baseline sentences the test items were based upon, six were judged as acceptable by all six speakers.

Of the remaining five baseline sentences, 2 were judged unacceptable by informant #6, 1 was judged unacceptable by informant #7, and two were judged as unacceptable by two speakers each. The two baseline sentences rejected by two speakers each are given as (4) and (5) below. Due to their relatively high rejection rate, all test items based on the baseline sentences for all speakers was dropped from the data.

(4) The more quickly we finish grading, the more quickly we will leave.

(5) The more you eat pizza, the less you want dessert.

For the items judged unacceptable exclusively by informant #6 and informant #7, test items from these individual items were dropped from the data for these individual speakers.

2. Summary of results

2.1 Individual speaker variation

As we would expect, there is individual speaker variation. However, it appears that this variation is not significantly different from informant to informant. The pattern from individual speaker to speaker most closely resembles the pattern seen when all speakers are averaged together and the relevant feature isolated is subordinate clause versus main clause.

2.2 Type of phrase modified by the comparative

The type of phrase being modified by the comparative also seems not to affect whether *that* can be inserted into a clause. The data is in Table A2 below.

Table A2

	Less acceptable (total “worse” responses)	Unacceptable (“worse” with a *)	Acceptable (total “same” and “better” responses)
IP	39.29% (11/28)	14.29% (4/28)	60.71% (17/28)
IP/IP	45.45% (5/11)	36.36% (4/11)	54.54% (6/11)
NP	41.46% (17/41)	19.51% (8/41)	58.54% (24/41)
NP/NP	61.11% (11/18)	22.22% (4/18)	38.89% (7/18)
ADJP	34.62% 9/26	15.38% 4/26	65.38% 17/26
ADJP/ADJP	70.00% 7/10	50.00% 5/10	30.00% 3/10
ADVP	40.00% 2/5	0.00% 0/5	60.00% 3/5
ADVP/ADVP*	N/A	N/A	N/A
Average of all types of phrases	44.60% 62/139	20.86% 29/139	55.40% 77/139

* the one baseline item that contained an ADVP modified in both clauses was judged as non-native by 3/7 informants, and possibly non-native by an additional 1 informants. Thus, there is no data available for this measure.

2.3 Which clause the optional-*that* insertion occurs in

Which clause the *that* is inserted into appears to be the relevant factor in whether the insertion is considered acceptable. The results for all test items for all speakers are summarized in the table below. When *that* is inserted into the first clause, there are no judgments of unacceptable, contrasting with *that*-insertion into the main clause in which ~33% of items are judged unacceptable. Even more convincing, when *that*-insertion is in the first clause, 84% of responses indicate that this change is the same or better than the original sentence.

This same table shows that the parallelism factor is not relevant. When *that* is inserted into both clauses, speakers reject these items at exactly the same rate they reject those items with *that* inserted into only the main clause (second clause). It is not that

speakers want the two clauses to be parallel; they want the second clause to not include *that*.

Table A3 – average of all speakers

	Less acceptable (total “worse” responses)	Unacceptable (“worse” with a *)	Acceptable (total “same” and “better” responses)
<i>That</i> in both clauses	58.00% (29/50)	34.00% (17/50)	42.00% (21/50)
<i>That</i> in adjunct clause alone	18.00% (9/50)	0% (0/50)	84.00% (42/50)
<i>That</i> in main clause alone	60.00% (30/50)	32.00% (16/50)	40.00% (20/50)

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