NATURAL LANGUAGE ADDITION VIA DEGREES, EVENTS, AND FOCUS

By

Cara Feldscher

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ABSTRACT

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This dissertation began asking where do we see addition in natural language? This began by reframing comparatives, it extended to other types of addition, looking at list environments and opening up questions about the nature of the language that enables "adding to lists", which in turn effected a cross-categorical research project, building on work on degree semantics, event semantics, focus, and discourse structure.

Work on comparatives is foundational in degree semantics and comparatives continue to be the source of ongoing research in the field (Cresswell, 1976; von Stechow, 1984; Kennedy & Levin, 2008; Schwarzschild, 2008). Here I work on an understudied ambiguity that can be analyzed as *more* creating an event summing reading instead of the typically studied reading. I contribute novel data showing a class of expressions participates in this ambiguity, supporting a compositional analysis. Event semantics typically analyzes adjectival constructions as stative constructions, in lieu of incorporating degrees (Davidson, 1967; Parsons, 1990). This research works in the interface between these two subfields, and provides an argument for studying their interactions, as well as a compositional account of one way we see degree constructions build to event constructions.

From there, I follow morphological link to discover a class of data that impressionistically adds propositions to lists, including data with the focus sensitive particle *also*. Following Rooth (1992), I provide an analysis of this list effect via the semantics of focus and focus sensitivity. This requires assuming that propositions as a whole can be focused, which in turn requires precise assumptions about how the discourse context is framed formally. I follow both the Table theory from Farkas & Bruce (2010) and the conversational scoreboard model of Roberts (2004), showing that pieces of both models can function as contextual restrictions on the focus semantic value for focus sensitive expressions. Further investigation showed that other focus sensitive expressions can have similar

restrictions, so major contributions of this include not only this revised notion of how to view "context", but also the ability to use focus sensitivity to investigate the nature of the discourse and what objects it contains.

The final section of this dissertation focuses on data linking these two previous sections. The appearance of aspectual particles like *still* in comparatives has been noted in the literature (Ippolito, 2007). This pretheoretically looks like an event related expression contributing to a degree construction, which is the opposite direction from the data analyzed earlier in this dissertation. However, following Ippolito's lead in analyzing *still* here as a focus sensitive particle, I implement the analysis of focus and contextual restrictions I laid out in the previous chapter. The result is that no evidence is found for treating this case as an event construction building to a degree construction, but also further evidence is given for my theory in which objects in the discourse are the contextual limitations on focus semantic values.

The major contributions of this dissertation thus fall into two main categories or topics. On the subject of degrees and events, novel data solidified a previously observed link. Then the analysis I proposed supports a compositional and directional analysis where degree constructions can be built into event constructions. This highlights the importance of research on the interface between topics and theories within the same subfield, like degree and event semantics. On the subject of focus and the discourse, again I contribute novel data showing a class of expressions, which supports an analysis involving focusing whole propositions. This analysis gives evidence that objects in the discourse are the "context" that restricts the focus alternatives. These restrictions are lexical, showing that research in this area, looking at other focus sensitive expressions, gives us a new tool to investigate the structure of the discourse with.

This dissertation is dedicated to Eleanor Parrish Molner Feldscher Riley.

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KEY TO ABBREVIATIONS

CG Common Ground

PS Projected Set

FSP Focus Sensitive Particle

NPI Negative Polarity Item

CHAPTER 1

INTRODUCTION

1.1 Overall framing

This dissertation is framed by analyses of data showing some of the ways we see addition in natural languages, and as a result it walks through a wide variety of semantic frameworks. I will analyze multiple phenomena that can be pre-theoretically described as involving some kind of addition, and end up grouping them into two major topics. In discussing these topics, I touch on degree semantics, event semantics, focus sensitivity, the structure of discourse, and what we want "context" to mean in formal semantic and pragmatic theory. Each of the three content chapters focuses primarily on one phenomenon, steps through an analysis, and then tries to investigate what predictions it makes as thoroughly as possible before discussing what the resulting implications are for formal semantics.

The first type of addition analyzed relates degree semantics and event semantics. I open this topic in Chapter 2 with data showing a link between the two, where the data shows ambiguity between adding degrees or events. In Chapter 4 I return to this topic with data that also looks to show a link between degree semantics and event semantics. The other major topic models addition on a discourse level in Chapter 3. This kind of addition moves away from what looks like numerical addition toward what looks like listing, or adding propositions to a list. This discourse aspect makes a major contribution by formalizing the role of context, specifically in a focus analysis. This topic is also continued in Chapter 4, where the data that looks degree-related is better analyzed via focus sensitivity.

1.2 Relating degree semantics and event semantics

To begin Chapter 2, I look at an addition related ambiguity that makes it clear there must be a compositional link between degree semantics and event semantics. Both degrees and events are

primitive types in the model, but semantic work often focuses on one or the other, rather than their interactions. Degree constructions (adjectival constructions) have been analyzed as states, as opposed to events, where states and events are both types of eventualities (Parsons, 1990). This would place degree constructions (roughly equivalent to adjectival constructions here) and event constructions (most verbal constructions) in complementary distribution, with no immediately obvious reason to try to link these two subsubfields. However, in this section I first contribute data showing that there is a regular, compositional relationship between the two kinds of constructions. My initial two observations on this research track were that *more* can be used to say something other than $A \geq B$, having a reading where it sums two events, and that several adjectives and phrases follow the same pattern that *more* does in having these two readings.

(1) John graded two papers. I graded **three more papers** than John. (*I graded* 2 + 3 *papers.*)

(2) Andrew and I have to grade all ten of these papers. He graded six papers, and I graded **three more** (papers), so we're not quite done. (*9 total, 6 for him, 3 for me*)

The typical degree use of *more* in (1) contrasts explicitly with the event use in (2). The typical degree use is most clearly "addition" in that it adds the degree before *more* with the degree in the *than*-phrase. In the case of (1), it adds 2 + 3 papers. The use of *more* demonstrated in (2) is less studied, and looks like a typical comparative but crucially it looks to be doing a different type of "addition". If (2) worked like a typical comparative, it would mean that I graded 3 + 6 papers, but instead it means that *we* graded 3 + 6 papers between us. That is, the "addition" is pretheoretically adding his paper grading event to my paper grading event to make a bigger event comprised of the sum of the two. This is the first observation, which I will go into more descriptive detail for in Chapter 2. This has been noticed in the past by a handful of other scholars, who have described it mostly as homophony between the typical comparative and this event reading. I will review their analyses in that chapter in greater detail, but the second observation I make here encourages me to make a different, compositional analysis rather than treat this as homophony. This second observation is that several words and phrases exhibit the same apparent homophony, which leads

me to treat it as a compositional ambiguity rather than a true homophony. This is exemplified by the following data with *additional*.

(3) a. I can run much further than Bill can. He can run three miles in one go, but I can run **an additional two** (compared to him). (*5 in one go*)

   b. My weekly running goal is five miles. I ran three miles yesterday, and then I ran **an additional two** today, so I hit my goal. (*2 today, 5 total*)

The data in (3) has the adjective *additional* instead of a comparative, but it has the same effect that *more* had. The first reading works like a comparative, having a degree meaning, and the second instead has the effect of event summing, where it talks about the total between the two running events, not just the one event today. In Chapter 2 I also lay out more novel data in order to show that this is a full class of expressions with this ambiguity, in support of analyzing this phenomenon compositionally instead of as homophony. After proposing an analysis for the dual meanings of *more*, I will extend it to this adjectival data as well, achieving a unified analysis.

Research on the comparative usage of *more* constitutes the foundation of studies of degree semantics in theoretical linguistics, but this is a use of *more* that is significantly less studied in the literature. The first contribution this work makes is simply in expanding the body of work on this use of *more*, and in contributing an array of novel data that illustrates this phenomenon. Additionally, the fact that we see an event summing meaning result from a prototypical degree construction is a sign that research on this topic allows us to investigate the interaction between the two semantic subfields of degree semantics and event semantics. In this chapter of my dissertation, I aim to use this data on addition in language to flesh out this apparent connection between addition and degree and event semantics, and discover what that in turn tells us about how we conceptualize comparison, addition, events, and time in natural language. The resulting compositional analysis indicates that there is a directional relationship, where degree constructions can be built into event constructions. I will return to the topic in Chapter 4 in order to look at data that appears related and ask if there is a directional relationship in the opposite direction possible as well. In addition, my analysis makes proposals about the nature of the comparative, and suggestions about what other

silent machinery might be involved in its workings. Extending the analysis to the type of adjective that participates in this phenomenon allows me to also make conclusions about how these adjectives must fit in to the theory.

1.3 Focus, the structure of the discourse, and adding to lists

In the next chapter of my dissertation, I add data showing something that I would pretheoretically classify as "addition" in a way of "adding to a list". While degree addition looked a lot like adding two numbers, this pretheoretically looks more like the phenomenon I called event summing in the previous chapter, where two events were combined in a way. This data follows a morphological link from the previous chapter, but for the actual analysis I end up stepping away from the degree semantics focus. The action of adding a proposition to a list is a move which operates more on the discourse level. That is, I will analyze these cases as "adding to a list" by virtue of analyzing how they relate to other propositions in the discourse structure, rather than by adding numbers or events. A sample of the relevant data is as follows, where we are looking at *in addition*.

(4) I did a lot of things last weekend! I hung out with friends... I went for a walk... In addition, I baked cookies!

(5) I did a lot of things last weekend! I hung out with friends... I went for a walk... Also, I baked cookies!

Looking at the two examples given, the puzzle for this section appears in list environments, and impressionistically it signals the continuation of the list along the lines of '*p, q, and in addition, r*'. The appearance of *in addition* in (4) is an example of the morphological link to the data in the previous chapter, where *addition* also appeared in the form of *additional*. Furthermore, in Chapter 3 I will show further data again showing this to be a class of expressions, including morphological links to *more* as well. However, the other example in (5) includes *also*, a particle that appears in research on focus sensitivity instead of research on degree semantics. Its usual use is to flag that *p* is true in addition to presupposing that *q* from the set of alternatives generated around the focused material is also true. This data initially looks like *also* has a use without its usual

presupposition, where instead, it seems to flag something about how *p* fits into the discourse. I use this as the starting point to frame a new analysis proposing the existence of proposition level focus, and discussing how that explains the apparently lack of a presupposition in this and other cases. I will propose that proposition level focus is available for focus sensitive expressions, but it makes it clear we must carefully define what it means for "context" to restrict the set of alternatives. I will propose that "contextual restriction" should be reframed as objects in the discourse acting as limits on the set of alternatives. As a result, the analysis I propose for discourse addition does not end up with a compositional link between it and the previous chapter's analysis, despite the morphological clues toward a link. Instead, my analysis is focus-based, and relies on a model of the discourse to restrict the focus set of alternatives. I will use the Table model of discourse proposed by Farkas & Bruce (2010), but some of the data in the second half of the chapter will merit incorporating some discussion of a conversational scoreboard model from Roberts (2018) and previous work. In either case, I will review the relevant models of discourse in the chapter itself. In terms of the analysis, it is unclear whether a compositional analysis can be created which builds discourse addition from the other types of addition I discuss in the previous chapter, and my analysis will not end up making this compositional link. Even without a compositional link to degrees and events, the analysis of discourse addition has consequences for how we model discourse, the relationship between propositions in the discourse, and the role of "context" in the semantics broadly and in focus specifically. In order to further explore the predictions of this definition for contextual restrictions, I then present data for a different case of a focus sensitive particle, *only*, which can also interact with proposition level focus.

(6)   I wanted to bake, only I didn't have any flour.

(7)   Only **Danny** passed the exam.

The example of *only* in (6) is different from the typical use of *only*, shown in (7). The bold in (7) indicates prosodic focus, where the interpretation of *only* is affected by what word is stressed, in this case meaning that Danny passed the exam and no other contextually relevant individual

passed the exam. The use of *only* in (6) does not clearly interact with any individual focused constituent, nor do the truth conditions of *only* act like it is interacting with any constituent smaller than the proposition as a whole. I will extend my analysis of proposition level focus and contextual restriction to this case of *only*, and importantly I will show that *only* must have a different contextual restriction than *also*. This is an argument in favor of lexically encoding these contextual restrictions for focus sensitive particles at least, rather than assuming contextual restriction applies as a uniform discourse phenomenon in these cases. This is a novel way of analyzing how the context interacts in the semantics, formalizing the pragmatic effect into the lexical semantics. It also opens up new questions and research avenues into how "context" works in other areas of semantics besides focus. Should we see restrictions based on the discourse structure lexically encoded in other things? Should we see some kinds of restrictions operating wholly independently and across the board? One final major take away from this avenue of research is the ability to use focus as a tool for investigating discourse structure. I will discuss this in greater detail in Chapter 3, but given that the different focus sensitive expressions that I analyze in this chapter utilize different objects in the discourse to restrict the results of proposition level focus, this means that one way to argue for the existence of different objects in the discourse that speakers track would be to see if phenomena like this can be analyzed as referencing those objects.

1.4 Links between these two major topics

In my analyses, these distinct addition-related phenomena from Chapters 2 and 3 will not share as much of an analytical link as the morphological evidence suggests they might. However, their analyses will have explored a variety of tools, linking degree semantics with event semantics in the first chapter, and linking focus and context with the discourse structure in the second chapter. In Chapter 4, I examine the case of a phenomenon that looks to fall in the space between these two chapters, potentially linking the preceding two chapters. This case is the appearance of particles like *still* or *yet*, which have been called aspectual particles, in comparatives, which can be seen in the following examples.

(8) Andrew graded six papers. I graded **still** more.

(9) Andrew graded six papers. I graded **yet** more.

The typical uses of words like *still* and *yet* are to give temporal information about the sentential event, making them ostensibly involved in event semantics. In data like (8) and (9) however, they are embedded in comparatives, making them ostensibly involved in degree semantics. Plus the overall meaning of the sentences is much like the sentence without *still* or *yet* in that it still contributes a degree interpretation instead of having added temporal information. The analysis in Chapter 2 delineates a relationship where degree constructions can be compositionally built up into event constructions. This kind of data on the surface looks to show the opposite direction, with words that typically contribute event information adding to a degree construction. However, following work on *still* by Ippolito, I find that this phenomenon is best analyzed as a focus sensitive expression that happens to be located within a degree expression, rather than as an event time expression contributing to a degree expression. While this analysis leaves behind the topic of "addition", it provides further support for the analyses in both previous chapters. For Chapter 4, it contributes another example of a focus sensitive expression interacting with proposition level focus, and adds further discussion to how the structure of the discourse can frame what it means to to "contextually restrict" something. For Chapter 2, its support is in *not* proving something. Rather, it shows that the data in (8) and (9), which could illustrate a relationship counter to the direction of the one described in Chapter 2, does not have to be analyzed as such. Proving the lack of something is difficult, and out of the scope of this dissertation, but this analysis counters some data that functions as an immediate counter to the relationship in Chapter 2.

Some research does exist on some of the phenomena I investigate here, but the cross-categorical nature of this research means that degrees, events, focus, discourse structure, and the pragmatics and semantics of context are all relevant. Rather than squish all of those topics together staccato in an introductory chapter, each chapter will contain its own relevant background. As far as I know, several of the phenomena I investigate here are not discussed in the research, but where an analysis exists, I flag them on a case-by-case basis. In all cases I aim to give enough background in the

overall subfield that the analysis makes sense, but exhaustively investigating the history, competing theories, and problems with each of the subfields I work in is beyond the scope of this work. As a result, the reader should not take any chapter's background to be a comprehensive resource on any of these overarching subfields. In terms of the unifying theme, the question of where do we see addition in language is not one that has a body of research behind it, outside of possible links to plurals. There is a huge literature on plurals specifically (Link, 2002), and this is a cross-categorical and cross-linguistic phenomenon as well. In addition to plural individuals, pluractionality, or plural events, shows that there might be some kind of summing strategy for the ontology. The topics I pursue here are not dissimilar, but it is different. Rather than focusing on how to make atomic types in the ontology plural, I focus here on how we see these and other things added in non-plural constructions, ones that do not necessarily involve adding semantic primitives. Similarly, there exists some work on numerals (Hurford, 1975), but this is also not quite my focus. Rather, I will simply be assuming numbers exist, and not questioning any internal structure or anything for them, as they are not the focus so much as a helpful thing for making addition clear.

In summary, the structure of this dissertation following the introduction is as follows. In Chapter 2, I present data showing an ambiguity between two different types of addition in language, which in turn illustrates a relationship between degree constructions and event constructions, and then I provide a directional, compositional analysis. In Chapter 3, I introduce a third type of addition, discourse addition. In order to analyze it, I model proposition level focus and propose a formal way to model contextual restrictions on it, and then I discuss its implications for both addition in language and how we model discourse topics as a whole. Next, in Chapter 4, I revisit both these topics via an analysis of aspectual particles in comparatives. Finally, Chapter 5 concludes and discusses the contributions of this dissertation.

CHAPTER 2

BUILDING EVENTS OUT OF DEGREES

2.1 Introducing an ambiguity with the comparative

The mainstream theories of adjectival constructions present them as degree constructions. While "degree semantics" covers a wide variety of topics and phenomena, a considerable portion of this subfield is built on and deals with *more* and comparatives (Cresswell, 1976; Kennedy, 1999; Schwarzschild, 2008; von Stechow, 1984). As I am incapable of summarizing the whole of this subfield here, and as the puzzles I look at here specifically build on existing analyses of the comparative, this will be the focus of my review here. In addition to being one of the best studied degree constructions, the comparative "more" has a second use with the appearance of building event meaning from a degree construction. Consider the following data.

(1) John graded two papers. I graded **three more papers** than John. (*I graded 2 + 3 papers.*)

(2) Andrew and I have to grade all ten of these papers. He graded six papers, and I graded **three more** (papers), so we're not quite done.   (*9 total, 6 for him, 3 for me*)

The use of *more* in (1) is the prototypical *A > B* comparative use, rephrased by Feldscher (2017a) as degree addition. The use of *more* in (2), however, describes what Feldscher (2017a) calls event summing, where it indicates that the two events can be added together, instead of *more* indicating an *A > B* scenario. They provide a compositional analysis for these homophonous two readings of *more* by building the more complicated event summing from degree addition. Additionally, as the following data shows, the adjective *additional* and some other phrases show the same ambiguity between the two readings. Feldscher (2017a) argues that the existence of multiple words and phrases with the same ambiguity supports a compositional analysis rather than analyzing this as a homophonous two *more*s. I will refer to adjectives with this ambiguity as *additive adjectives*.

(3)   a.   I can run much further than Bill can. He can run three miles in one go, but I can run **an additional two** (compared to him).   (*5 in one go*)

       b.   My weekly running goal is five miles. I ran three miles yesterday, and then ran **an additional two** today, so I hit my goal.   (*2 today, 5 total*)

(4)   a.   I can run much further than Bill can. He can run three miles in one go, but I can run **an extra two** (compared to him).   (*5 in one go*)

       b.   My weekly running goal is five miles. I hit my goal yesterday, and then I ran just **one extra mile** today, so I surpassed my goal.   (*1 today, 6 total*)

The data in (3) and (4) shows the same degree addition / event summing ambiguity that *more* did above, but with additive adjectives, highlighted in the bolded section. The (a) version of each has context supporting a degree addition (like the typical comparative) reading, and the (b) version has context supporting an event summing reading. As per the italics, the degree addition reading in (a) adds together the two numbers like a differential comparative, but the event summing reading in (b) does something more. The two events are added together to create a superevent, and the two degrees are added for that summed event. The local[1] event itself has no degree addition, which the meaning given in italics makes clear. In further support of a compositional analysis, consider the following data as well, where the same ambiguity appears with phrases larger than an adjective.

(5)   a.   I can run much further than Bill can. He can run three miles in one go, but I can run **two miles in addition to that**.   (*5 in one go*)

       b.   My weekly running goal is five miles. I ran three miles yesterday, and then ran just **two miles today in addition to that**, so I hit my goal.   (*2 today, 5 total*)

(6)   a.   I read more things than Andrew did. He only read two books, but I read **three papers on top of that**.   (*I read 5 things total*)

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[1]I will refer to the "local" event or degree to mean the one in the sentence, near to the additive expression. "Non-local" then refers to the other, contextually relevant event mentioned, which is non-local in that it is further from the additive expression and possibly in another sentence. The "summed event" is these two events added.

b. Andrew and I need to grade all 10 of these papers. We are halfway done because Andrew graded three papers and I graded **two papers on top of that**. (*2 for me, 5 together*)

The data in (5) and (6) shows the same ambiguity as *more* and the additive adjectives, but via more syntactically complex phrases. While in (5) repeats the same *addition* root, the phrase in (6) seems completely distinct. If we were looking at just *more*, a homophony analysis is reasonable. However, the reappearance of what looks like the same kind of ambiguity with the same two meanings with different syntactic categories and in more complex phrases is a strong argument in favor of a compositional analysis instead of a homophony analysis. Specifically, it supports unifying the analysis for *more*, additive adjectives, and more syntactically complex phrases, and a compositional account that works with all three is the most straightforward way to do this. In this family of data, I will begin with an analysis for *more*, as comparatives are well studied, and there is a wealth of research to start from. From there, I will extend the analysis to additive adjectives in support of a compositional analysis.

If a compositional analysis is to link these two readings, then either degree addition can be the base reading which is then built to event summing in some way, or event summing can be the base reading which is then built to degree addition in some way. I will propose that degree addition is the base, on account of some dialectal English data involving *again*. *Again* is a quintessential event word dealing with iteration, although a number of related uses have been described (Ippolito, 2007; Von Stechow, 1996). The following data is only acceptable in some dialects of English, but in those dialects, what I am referring to as additive *again* can appear with a degree interpretation instead of an aspectual interpretation. On the surface, this could be interpreted as an event kind of morpheme contributing to degree meaning instead of a degree morpheme contributing to event meaning, but following Feldscher (2017b) I will analyze it differently.

(7) 'Standard' *again* (event repetition)

a. I shut the door again.

      b. She ran a marathon again.

(8)   Additive *again* (degree addition)

      a. These apples are half again as expensive as those oranges.   (*apples 1.5x oranges*)

      b. She ran half again as many marathons as I did.   (*she ran 1.5x what I ran*)

Feldscher (2017b) proposes a noncompositional analysis, which I will walk through in greater detail in this chapter, but a compositional analysis building one denotation for *again* from the other seems unlikely. In addition to the complicated denotation that will be needed for an analysis of degree *again*, consider its dialectal status. *Again* is prototypically seen in event constructions, giving information about the (re)occurrence of a state or event. While some speakers have a degree *again* available, not all do. In comparison, as far as I know, speakers can get both the degree and the event readings out of *more* and the other additive expressions. As not all event expressions can interpreted as degree constructions, but the degree expressions here all have event interpretations, the analytical direction I will take is building event summing compositionally from a base of degree addition.

In this chapter, I will first give a brief background on degree and event semantics to the extent that I will use those frameworks and analytical tools, at which time I will also give a brief overview of the work that has been done on this ambiguity for *more* specifically. Moving on from any necessary background, I will provide some further data on *more*. Next, in order to begin to analyze *more*, I will first walk though an analysis for additive *again* as a first step toward building a compositional analysis for *more*, as previewed in the previous paragraph. With that starting point, I will propose an analysis for *more* that builds event summing from degree addition. Finally, after stepping through that analysis, I will then test it by extending it to additive adjectives.

2.2   Frameworks and analytical tools

This analysis necessarily works with both degree semantics and event semantics, so some quick review of both is needed. In either case, a full background gets away from the topic of this dissertation, but I will minimally review the analytical tools I will be using, and the frameworks I

will be working within. The framework that I will be working in assumes the existence of events and states, which are grouped together as eventualities of type *v* (Davidson, 1967; Parsons, 1990). While adjectival constructions are often studied in degree semantics frameworks, assuming them to involve stative arguments is uncontroversial. However, I have analytical choices to make in terms of the degree semantics framework I will use, so this section will first step through that. Next I will provide a brief overview of what analyses have been proposed for this non-comparative use of *more*, before summing up and moving on to my own analysis.

2.2.1 Wellwood's theory of Degree Phrases

Two major theories of the comparative exist. There is a huge amount of work in the literature on degree addition in the form of the comparative, and there is not a consensus on what theory is precisely right. One main theory has the Degree Phrase as the extended projection of which the Adjective Phrase is an argument (Abney, 1987; Kennedy, 1999), and the other has the DegP within the AP and scoping out (Bresnan, 1973; Bhatt & Pancheva, 2004). Either has advantages in dealing with certain issues. If the DegP is the extended projection of the AP, then this structure parallels the functional head structure of X′ theory, building to a overarching generalization that lexical categories are all nestled inside functional projections. This is a theoretical elegance that I appreciate, but make no predictions about in my work. However, if the DegP moved out of the AP, this predicts scopal ambiguities that are observed in some cases (Heim, 2000). While movement does work well for dealing with scope, there does not appear to be any scopal issues in the data I am working with. In order to work in a framework that actively enables my analysis, I consider the data I need to account for.

In this dissertation, I will follow the Degree Phrase structure proposed by Wellwood (2015) in order to take advantage of the cross-categorial nature of her analysis. The degree addition / event summing ambiguity occurs with eventualities of multiple types, not limited to degrees occurring with adjective phrases. Consider the following examples, where (9) has an adjective *long* which should evoke a state of length (of time), and (10) involves book-reading events instead of adjectival

states.

(9)   I am trying to run for longer stretches of time. Earlier I ran for 10 minutes, and just now I ran for 15 minutes longer.

(10) I read a lot of books this week. Monday I read 2 books, and Tuesday I read 3 more books.

The *more*/*-er* in (9) interacts with the adjective *long*. As the previous subsection discusses, this could be treated as a state of length. The *more* in (10) deals with an eventive verb, dealing with a scale of quantity that maps on to the reading event, and again the ambiguity is present. In the degree addition reading, I read 5 books on Tuesday, 3 more than on Monday. In the event summing reading, I read 5 book total, 2 on Monday plus 3 on Tuesday. Wellwood's cross categorical DegP is well suited to this data, as it reflects the appearance of *more*, and this homophony, with eventualities of multiple types.

Wellwood (2015) builds on Bresnan's 1973 approach, not assuming the DegP to be a functional projection of the AP, but also not involving QR. She breaks down comparative *more* into *much-er*, where *much* provides a contextually supplied measure function μ via an assignment function *A*. She argues that a measure function must be accessible that measures individuals and eventualities both, using a scale that is monotonic on the eventuality or individual, following Schwarzschild's 2006 work on measure phrases. Schwarzschild (2006) shows that measure phrases must be monotonic on the mereology of the event or individual being measured in the case of partitives, meaning that measure phrases need to use units that measure out parts of the individual, or that measure along a dimension that coincides with the part structure of an individual. This generalization is on the strength of data like (11).

(11)   * Bill poured 50 degrees of coffee.

The sentence in (11) is ungrammatical, due to the fact that a temperature scale does not measure out parts of the coffee. Wellwood gives evidence, however, that there are still multiple scales possible after non-monotonic scales like temperature or speed are ruled out. In (12) and

(13), *more* must be able to access multiple scales in the same construction, as multiple scales can be explicitly set for comparatives that otherwise look the same. Consider the following examples.

(12)   John poured more coffee than Bill did, in terms of $\left\{\begin{array}{l}\text{volume} \\ \text{weight} \\ \text{number of cups filled} \\ \text{*temperature}\end{array}\right\}$

(13)   John ran more than Bill did, in terms of $\left\{\begin{array}{l}\text{distance} \\ \text{time} \\ \text{number of marathons ran} \\ \text{*speed}\end{array}\right\}$

In (12), the scales of volume, weight, or number of cups are all possible for the comparative *more coffee*. All of these scales can be monotonic on the running event, whereas temperature, for example, can not be, and is therefore ungrammatical there. In (13), *ran more* can be measured in terms of distance, time, or number of marathons. A non-monotonic measure like speed cannot be set as the scale. On this basis, Wellwood proposes that *-er* references a contextually relevant measure function μ. If the scale is explicitly set like in the above data, that would be the scale for μ. If there is no explicit scale, then something appropriate for the context and the thing being measured is used, as μ is a free variable and the speaker is free to determine what fits best. Here in (14) are the denotations Wellwood proposes, where applying *much* to *-er* produces the familiar *more*, and where *-er* is flexible in the type of measure function that it takes in. Recall that A is the assignment function, and the subscript μ references the contextually relevant measure function.

(14) $[\![\text{-er}]\!] = \lambda g_{\langle \alpha,d \rangle} \lambda d \lambda \alpha . g(\alpha) > d$

  $[\![\text{much}_\mu]\!]^A = A(\mu)$

  $[\![\text{more}_\mu]\!]^A = [\![\text{-er}]\!]([\![\text{much}]\!])$

  $[\![\text{more}_\mu]\!]^A = \lambda d \lambda \alpha . A(\mu)(\alpha) > d$

I build my analysis using the denotation of *more* (*much-er*) from this paper for two reasons. First, it is a reasonably straightforward denotation, and it is simpler to work with a theory without movement to start with. Second, as has already been demonstrated in the data provided so far, this ambiguity occurs in constructions measuring a variety of things, showing the scale-flexibility Wellwood works with. It makes sense to work with a theory designed to capture that fact. However, in this chapter's analysis, I will start by assuming this simplified version in (15), where it is identical to the final like in (14) except the assignment function is omitted.

(15) $\llbracket \text{more}_\mu \rrbracket = \lambda d \lambda \alpha . \mu(\alpha) > d$

2.2.2 Existing analyses of the ambiguity for *more*

Besides the small few references I mention here, the literature on degree semantics and event semantics is huge and the phenomena I am working with here is not going to bear on it as a whole. Instead, it is worth reviewing what there is in the literature on *more* specifically in the context of event summing, which is a much smaller task. The main requirements for a denotation of event summing *more* are (1) the local degree must measure the local event (for the asserted content of the proposition), (2) there must be a non-local event that can be measured and can be summed with the local event, and (3) the measure of the summed event is the measure of the local and non-local events added together. There are two accounts in the literature of what they call either "incremental *more*" or "additive *more*", by Thomas (2010) and Greenberg (2010, 2012) respectively. Both of these are the event summing version of *more*, but I will refer to both here as denotations for an incremental *more*, to avoid any confusion with "additivity" possibly referring to adding degrees or summing events. Both of these analyses assume the event summing incremental *more* to be a separate morpheme from comparative *more*. Based on the robust ambiguity of additive expressions in English, I propose that it is not, but for now I review their theories here.

Greenberg (2010, 2012) analyzes incremental *more* as a homophonous morpheme to comparative *more* on the strength of the fact that they have different translations in Hebrew and in multiple other languages. Incremental *more* is homophonous with the morpheme meaning *still* in Hebrew,

which invites a different comparison with eventualities, but comparative *more* is translated using a different word. In their data below, *yoter* is the word that appears in comparatives, as opposed to *od*, which is used for event-summing *more* and also for a meaning which is translated as *still*.

(16)   Rina od   yeSena
       Rina still asleep
       'Rina is still asleep.'

(17)   (etmol   axalti 3 tapuzim) ha-yom axalti od (tapuzim)
       (yesterday I-ate   3 oranges) the-day I-ate od (oranges)
       '(Yesterday I ate 3 oranges.) Today I ate some more (oranges).'

(18)   hayom dani   ri'ayen   SloSa studentim. etmol   hu ri'ayen   yoter/#od
       today Danny interviewed three students.   yesterday he interviewed yoter/od
       'Today Danny interviewed three students. Yesterday he interviewed more (than three).'

After they establish this argument for separating both uses of *more* into separate morphemes, they describe what incremental *more* must do. The main thrust of their argument is that the presupposition of additive *more* is that there is a previous event and it can be summed with this eventuality to create a super-event. In order for events to be summable, they must both be stages of the same super-event. That is, the super-event must be a more developed version of the two events being summed (Landman, 1992). Based on the theory that states do not have time arguments, Greenberg argues that they can also then not have stages, explaining the infelicity of additive *more* with stative predicates. This is based off data like (19).

(19)   * Rina was dirty some more.

As *dirty* is a state, and *some more* should only result in an event summing reading, the ungrammaticality of (19) is argued to be due to the fact that states are incompatible with event summing. If this is the case, that states cannot have time arguments or have stages, then they are predicted to not be summable in Greenberg's theory. As was already mentioned, I will work with eventualities as a whole in my analysis, rather than specifically work with events and not states. While more difficult to sum, states can be added if the right context is created to make it felicitous,

as I demonstrate below in (20). Another example of building an appropriate context would be the additive *another* context provided by Thomas (2011), which is also repeated here in (21).

(20) I am measuring how tall a stack my books would make if I stacked them all. Previously it was up to $4'10''$, but I just bought *The Fireman*, which is **1.5 inches more**.

$$(1.5'' \ Fireman, \ 4'11.5'' \ stack)$$

(21) A: How wide are those two pieces of furniture together?

B: The cabinet is 4 ft wide. The shelves are **another 3 ft wide**. (*3ft shelves, 7ft total*)

Using *more*, (20) is successfully interpreted as event summing with a state of height. On the strength of this evidence that states can sum like events can, if supported with the proper context, I will not deal separately with states and events with my own analysis, but rather classify them all together as eventualities. Additionally, (21) supports that this is the case for additive adjectives, which falls in line with the assumption that additive expressions and *more* work in the same way.

In (23) I provide the denotation for the nominal usage of incremental *more* that Greenberg (2010) comes up with. This is in a sentence like (22), where the things being added are ostensibly nominal things. The underlined portion of the denotation is a presupposition.

(22) Four children sang, and three more danced.

(23) $[\![(\text{Nominal}) \ \text{more}_{add}]\!] = \lambda d_1.\lambda Q_{\langle e,t \rangle}.\lambda P_{1 \langle e, \langle v,t \rangle \rangle}.\lambda e_1.[\exists x[Q(x) \wedge P_1(x)(e_1) \wedge \mu(h(e_1)) =$
   $d_1 \wedge \underline{\exists e_2, P_2, d_2, y[P_2(y)(e_2) \wedge Q(y) \wedge \mu(h(e_2)) = d_2 \wedge \tau(e_2) \leq \tau(e_1) \wedge}$
   $\underline{\exists e_3, P_3, z, *P_3(z)(e_3) \wedge e_3 = e_1 + e_2 \wedge Q(z) \wedge z = x + y \wedge \mu(h(e_3)) = d_1 + d_2 \wedge}$
   $\underline{e_3 >_{developed} e_2}]]]$

Here h is a homomorphism from eventualities to individuals, reflecting that the development of this event is measured in the number of individuals that participated. The denotation for incremental *more* says that *more* takes in a degree, a nominal predicate, and then a verbal predicate. The assertion is that the local degree measure the local event. For the underlined presupposition, from the first existential quantifier ($\exists e_2$) until the second ($\exists e_3$), this part of the presupposition says

that there is a different event e_2, which is temporally prior to the local event e_1, and that this event can be measured by individuals numbering d_2. The rest of the presupposition introduces a third event e_3, which is equal to the sum of e_1 and e_2, and the measure of it is equal to the sum of the measures of e_1 and e_2. The final conjunct introduces the concept of stages, saying that the summed event can be considered a more developed version of the first event e_2. This does account for the data, but it does not account for the ambiguity of readings I described, nor for how the entire class of additive expressions patterns in the same way.

Greenberg (2010) additionally provides a slightly different analysis for the predicative useage (*Mary ran for a little while and then she walked two minutes more*), in order to work with different semantic types for different syntactic types. However, I will only discuss the one here as an example, as the nominal analysis is along the same lines and discussing both will not add anything helpful to my points. My arguments for a different analysis hold in the same way for the predicative iteration of Greenberg's analysis as it does for the nominal half.

The other proposal in the literature for event-summing *more* is by Thomas (2010). Thomas returns to the topic from a slightly different in later research as well, which I will go into after. One of the effects that Thomas aims to capture in his 2010 paper is that different types of events can be summed, as shown in (24).

(24)   A: How much did you exercise last week?

B: I ran for two hours and I biked for three hours more.

The response in (24) sums a running event and a biking event together for a greater exercising event. In order to sum different types of events, he calls an a function *alt* in their denotation for incremental *more*. The *alt* function generates a set of contextually relevant alternatives of the same type of the thing to which it's applied, much like focus is proposed to do. So in this case in (24), biking is a relevant alternative to running, given the context of exercising.

Below, (25) shows the denotation for incremental *more* proposed by Thomas (2010). Again, the underlined portion ia a presupposition, which in this case is just that there is alternative event.

Thomas argues that the summed event measuring the added measures of the local and non-local event is asserted rather than presuppositional, as Greenberg analyzes it.

(25) $[\![more_{inc}]\!]^{g,c} = \lambda d.\lambda e'.\lambda D_{\langle d,\langle v,t\rangle\rangle}.\lambda e.\underline{\exists d'\exists D' \in alt(D)[D'(d')(e')]} \wedge D(d)(e) \wedge \exists D'' \in$

$alt(D)[D''(d + \delta)(e \oplus e')]$

where $\delta = \iota d'[\exists D' \in alt(D)[D'(d')(e')]]$

While stylistically somewhat different, this denotation accomplishes much the same thing that Greenberg's does. There is a presupposition that there is an event in the alternative set of the local event, and it asserts that this event is summed with the local event in order to measure an amount that is the local degree and the measure of the presupposed degree added together. The main difference between the two analyses I have reviewed here is that for Greenberg, the summed event and its measure are a part of the presupposition, whereas for Thomas they are a part of the asserted content. The presupposition is limited to the event that is summed *with* the local event. Using his example (26) to illustrate, Thomas argues that the summed event ("incremental clause") here is the proposition that we have had four beers, two on the the table and two in the fridge, which is contradictory to set up context in (26). As (26) lacks any contradictory feel, Thomas argues that no presupposed summed event can be projecting out of the conditional.

(26) We only have two beers. They were on the kitchen table and Chuck drank them both. If there were two more beers in the fridge, Chuck would drink them both.

Like Greenberg (2010), Thomas also argues in his 2010 paper that incremental *more* is incompatible with stative predicates like *long*, but in his later 2011 analysis of *another*, he deals with eventualities as a whole in order to include states in addition to events. Consider his example repeated in (27).

(27) A: How wide are those two pieces of furniture together?

B: The cabinet is 4 ft wide. The shelves are another 3 ft wide.　　*(3ft shelves, 7ft total)*

In (27), *another* does event summing with a state of width, with the help of the supporting context. This reading is event summing because there is no degree addition for the local eventuality,

which would make the shelves 7 ft wide, but rather the statement from Speaker B flags that these two states of width can be summed. On the topic of the supporting context, for his denotation of additive *another* in Thomas (2011), Thomas introduces the Question Under Discussion (QUD) as a use condition, modeling a presuppositional requirement to using *another* in this way. Compare (27) with another of his examples in (28).

(28)   A: How wide are the shelves?

B: The shelves are (*another) 3 ft wide.

The question in (27) explicitly raises the summed state and its measure in the QUD. The question in (28) does not, but only asks about the measure of the local state. Based on this, he reformulates the presupposition to be that there exists a question in the QUD, in order to then assert something about that question. For clarity, I have underlined the presupposition.

(29) $[\![\text{another}]\!] = \lambda d'.\lambda d.\lambda P_{\langle s\langle d,t\rangle\rangle}.\lambda w : \underline{\exists Q \in QUD(c)[R(Q) = \Re \wedge B(Q)(w)(d'+}$
$\underline{\iota d''[P(w)(d'')])]}.P(d)$

To step through this denotation briefly, the first conjunct in the presupposition says that the question in the QUD is restricted to the set of real numbers, and therefore is a degree question. The second conjunct says that this question can be answered by adding the degree argument of *another* to the degree that holds of the local property P. The asserted part of the denotation simply relates the local degree to the local property.

To sum up this section so far, both Greenberg and Thomas have analyses that account for the event summing reading of *more*, and Thomas similarly accounts for event-summing *another*. All of these analyses successfully replicate the truth conditions of event summing *more* (and *another*), but what these analyses do not account for, however, is the behavior of the class of additive expressions in English as a whole, where multiple expressions with degree addition readings also have event-summing readings.

Thomas (2017) more recently takes on a very related but slightly different homophony. He does not look at the class of additive expressions, but rather at patterns of homophony between

comparison / degree addition, event summing (what Thomas calls additivity), and continuation (as expressed by English *still*). He observes that cross-linguistically, there are languages where comparison is homophonous with event summing (like English), languages where event summing is homophonous with continuation (like Hebrew), and languages where all three are homophonous (Romanian for example), but no languages in their study where comparison is homophonous with continuation and not event summing. This pattern is shown in (2.1), where shared letters indicate that shared / homophonous words are used to express those things in that languages.

Table 2.1: The cross-linguistic patterns of homophony from Thomas (2017)

Languages	Comparison	Additivity	Continuation
Romanian	A	A	A
English, French, etc.	A	A	B
German, Hebrew, etc.	A	B	B
Vietnamese	A	B	C
unattested?	A	B	A

The pattern observed is that all three can be homophonous, comparison and additivity can be homophonous, or additivity and continuation can be homophonous, but comparison and continuation cannot be homophonous with the exclusion of additivity. Thomas explains this pattern via an analysis in Distributive Morphology. In Thomas's analysis, what all three of these meanings have in common in their theory is a rising scale segment (Schwarzschild, 2012). In Schwarzschild, comparatives are analyzed as being composed of pieces that say that on a scale like height for example, Andy is taller than Danni if there is a rising scale segment starting at Danni and ending at Andy. Thomas extends this analytical tool to analyze not just comparison (degree addition), but also additivity (event summing) and continuation. All three of these readings are not compositionally linked, but rather all three involve a rising scale segment, and varying spell-out rules create the pattern of homophony shown in (2.1). So in languages like Romainian, homophony is achieved by assuming a Lexical Insertion rule that applies everywhere there is the Deg head RISE. This is a rising scale segment, and in a comparative, it describes the difference between the two things being compared. Similar to the theory I will propose here, a functional head ADD applies higher up and sets it such that the rising scale segment describes the increase in the measure of the summed event,

making it event summing. Thomas goes on to create continuation (*it is still raining*) by adding another functional head CON to this projection. The patterns of homophony in different languages is then achieved by assuming different Lexical Insertion rules in different languages, where the three meanings are spelled out with one, two, or three different lexical items. This accounts for the pattern of attested and unattested homophony.

While the English *more* data that I am analyzing fits this cross-linguistic pattern, in this chapter I am focusing on a related, but slightly different issue. Specifically, here I will address the issue of a whole class of additive expressions featuring this degree addition / event summing ambiguity, with the goal of explaining the persistent ambiguity within English. To that end, I will pursue a slightly different analysis also building event summing from degree addition, but with the goal of this analysis providing a compositional piece of machinery that works with additive expressions other than *more*.

2.2.3   Summing up background

At this point, we have a flexible framework for the DegP that works with the relationship between states and events that I am assuming. This is what I will be working with, although I will propose a small change during my analysis itself. While previous analyses of the additive ambiguity with *more* have been presented also, I have presented evidence that they will not suffice. In the next section, I will analyze *more* as the first case study in this overarching ambiguity, with the goal of presenting an analysis that extends cleanly to analyzing additive adjectives. That extension to additive adjectives will be the second case study after that.

2.3   Case study 1: ambiguity with *more*

In this section I will propose an analysis for the ambiguity allowing *more* to add different things. First I will walk through some further data (focusing on *more* but including some additive adjective data), with the goal of fleshing out what allows or blocks this ambiguity, and secondarily with the goal of fleshing out what differences may exist between *more* and other additive phrases. Then

I will walk through existing analyses of *more* as an independent morpheme that happens to be homophonous to the comparative, before talking through my own compositional analysis.

2.3.1 Further data

Given the correct contexts, many sentences with *more* are fully ambiguous and can be used felicitously to mean degree addition or event summing. There are, however, two ways (besides heavily biased contexts) to disambiguate between the event summing and degree addition reading by syntactically forcing one or the other. The first, which was observed by Greenberg (2010), is that including an unstressed *some* with *more* ensures an event summing reading, as seen in (30).[2]

(30)   Yesterday I ran 2 miles, and today I ran some more.

χ (*Degree addition - I ran > 2*)

$\checkmark$ (*Event summing - I continued running*)

As is marked in the italics, the reading of *today I ran more than 2 miles* is unavailable, and this has to mean instead that the speaker continued the running event for some amount. It is clear that *some* is doing something here if we compare it with something like *a little bit*, which does not lose the degree addition reading.[3]

(31)   Yesterday I ran 2 miles, and today I ran a little bit more.

$\checkmark$ (*Degree addition - I ran > 2*)

$\checkmark$ (*Event summing - I continued running*)

To extend this to additive adjectives and larger additive phrases, the same effect results. All of the sentences in (32) also have only the event summing reading, not the degree addition reading. There are minor syntactic differences between different additive expressions, in terms of what elements must be overt or covert, but I will return to that in more detail later.

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[2]In all of these examples I am considering only the indefinite plural *some*, not the hedging *some* that we might see in a sentence like *They ran some five miles before they stopped*.

[3]Thanks to Karthik Durvasula for suggesting this comparison.

(32) a. Yesterday I ran 2 miles, and today I ran some $\begin{Bmatrix} \text{additional} \\ \text{extra} \end{Bmatrix}$ miles.

χ (*Degree addition - I ran > 2*)

$\checkmark$ (*Event summing - I continued running*)

b. Yesterday I ran 2 miles, and today I ran some $\begin{Bmatrix} \text{in addition (to that)} \\ \text{on top of that} \end{Bmatrix}$.

χ (*Degree addition - I ran > 2*)

$\checkmark$ (*Event summing - I continued running*)

The second way to force one of the two readings works with *more* specifically, and not with the other additive expressions. This method is that the inclusion of a standard degree in a *than* phrase necessitates a degree addition reading, as shown in (33), an observation which was also made by Thomas (2017).

(33) Yesterday I ran 2 miles, and today I ran more than I ran yesterday.

$\checkmark$ (*Degree addition - I ran > 2*)

χ (*Event summing - I continued running*)

It is impossible to extend this method of disambiguation to the additive adjectives due to syntactic differences, which brings me to the next group of data worth stepping through. The different additive expressions listed here also have some syntactic differences from each other that are worth discussing. The data given so far has shown that *more* can optionally have a *than* phrase or not, although its presence ensures a degree addition reading. While they are optional with *more*, *than* phrases are totally incompatible with additive adjectives.

(34) Today I ran two miles more (than I ran yesterday).

(35) Today I ran an $\begin{Bmatrix} \text{additional} \\ \text{extra} \end{Bmatrix}$ two miles $\begin{Bmatrix} \text{*than I ran yesterday} \\ \text{*from what I ran yesterday} \end{Bmatrix}$.

In the case of one of the more syntactically complicated additive expressions, things get a little murky and a little less regular. Shown in (36), *on top of* requires the standard degree, although it

is also then introduced with something other than *than*, appearing here as *what I ran yesterday*. In the case of (37), the standard degree is optional again for *in addition to*, but it is introduced with yet a different preposition, appearing with *to* instead of *of*.

(36)   Today I ran two miles on top *(of what I ran yesterday).

(37)   Today I ran two miles in addition (to what I ran yesterday).

Finally, one other difference between *more* and additive adjectives is that additive adjectives often take a determiner, which is itself restricted in selection, as shown in (38). Additionally, an overt non-demonstrative determiner is disallowed once the overt number is gone, as in (39).

(38)   I ran
$\left\{\begin{array}{l} *\emptyset \\ \text{an} \\ \text{the } (\textit{only w/context}) \\ \text{that/those } (\textit{only w/context}) \\ *\text{some} \end{array}\right\}$
$\left\{\begin{array}{l} \text{additional} \\ \text{extra} \end{array}\right\}$ 3 miles.

(39)   I ran
$\left\{\begin{array}{l} \emptyset \\ *\text{an } (\textit{not meaning 1}) \\ *\text{the} \\ \text{those} \end{array}\right\}$
$\left\{\begin{array}{l} \text{additional} \\ \text{extra} \end{array}\right\}$ miles.

In some cases, a determiner is felicitous, but only in supporting contexts, such as where there is already an established 3 miles under discussion. The determiners that are felicitous only in supporting contexts are flagged as such, and are otherwise infelicitous without accommodating a context like this. In the case of *an* in (39), this is grammatical if we interpret it as meaning *one*, but if we interpret it as a generic indefinite, it is not acceptable. These distribution of determiners changes again slightly if we consider the more syntactically complex additive expressions.

$$(40) \quad \text{I ran} \left\{ \begin{array}{l} \emptyset \\ \\ \text{*a} \\ \\ \text{the (\textit{only w/context})} \\ \\ \text{those (\textit{only w/context})} \end{array} \right\} \text{3 miles on top of that.}$$

In comparison, *more* does not take a determiner if there is an overt number, but there does seem to be a position available if there is no overt number, to compare (41) and (42). While the determiner here may be a part of the measure phrase and not belong to *more* in any way, the distribution still shows a clear distinction from that of the additive adjectives, and there is evidence that the two should be analyzed as syntactically distinct.

$$(41) \quad \text{I ran} \left\{ \begin{array}{l} \text{*a} \\ \\ \text{*the} \\ \\ \text{*that/those} \\ \\ \text{*some} \end{array} \right\} \text{3 more miles.}$$

$$(42) \quad \text{I ran} \left\{ \begin{array}{l} \text{*}\emptyset \\ \\ \text{a} \\ \\ \text{*the} \\ \\ \text{that (\textit{only w/context})} \\ \\ \text{*some} \end{array} \right\} \text{mile more.}$$

To sum up this section, I have walked through some ways to disambiguate the degree addition / event summing ambiguity, and then through some ways in which *more*, the additive adjectives, and the more syntactically complex additive phrases differ. They patterned similarly (where applicable) in terms of disambiguations, which is another argument in support of a compositional analysis that works similarly for *more*, additive adjectives, and additive phrases. The differences pose a potential counterargument to that strategy, but I will propose that they simply result from different syntactic categories, which is not counter to a compositional analysis working similarly across categories.

2.3.2 Case study 1.5: additive *again*

The first step I want to take in stepping through my own analysis of *more* is actually to provide an analysis of something else, as a compositional explanation of homophony can involve building directionally either from A to B or from B to A. The cross-linguistic data with the pattern of homophony that Thomas (2017) describes supports an analysis where degree addition is compositionally built into event summing, not vice versa, and this is indeed the direction of compositionality that I will pursue. However, another argument in support of this directionality comes from English data involving *again*. One other phenomena in the literature where "additivity" has been discussed is with additive *again*, a use of *again* that I previewed at the beginning of this chapter, which deals with degrees instead of the usual repetition or restoration of eventualities (Feldscher, 2017b). The availability of this use of *again* varies by dialect, and it additionally has a very restricted syntactic distribution, so it seems unlikely that a compositional analysis of additive *again* will be a strategy we want to assume is freely available in language, unlike that of additive *more*. To illustrate the difference the 'usual' use of *again*, showing repeating an event or restoring a state, is in (7), and "additive", or degree-adding *again*, is in (8).

(43) 'Standard' *again* (event repetition or state restoration)

    a. I shut the door again.

    b. She ran a mile again.

(44) Additive *again* (degree addition)

    a. These apples are half again as expensive as those oranges.   (*apples 1.5x oranges*)

    b. She ran half again as many miles as expected.   (*she ran 1.5x what was expected*)

For the readers who do not have this use of *again* in their dialect, the truth conditions of the sentences with additive *again* are glossed briefly in the parentheses. So (44a) means that the price of the apples is equal to one and a half times the price of the oranges. This degree use in (44) is in contrast to the standard non-degree use in (43), which should not be contentious among speakers of English. Between speakers of dialects with this use of *again*, there is some variation on what the

structure of a sentence with additive *again* can look like. The British word order is the (b) version in (45), as opposed to the American English word order in (45a). And additionally, while additive *again* seems to appear most often with *half*, it is capable appearing without *half*. Some examples with other factor phrases or versions without factor phrases are shown in (46).

(45)   a.   Neville is half **again** as tall as Pansy.   (*1.5x Pansy's height*)

      b.   Neville is half as tall **again** as Pansy.   (*1.5x Pansy's height*)

(46)   a.   Neville is **a third** again as tall as Pansy.   (*1.33x Pansy's height*)

      b.   Neville is **three quarters** again as tall as Pansy.   (*1.75x Pansy's height*)

      c.   Pansy is four feet tall. Neville is **that** again.   (*2x Pansy's height*)

      d.   I shall probably have paid at least **as much** again in call charges.

(*Example from the OED, meaning 2x*)

The Oxford English Dictionary glosses *as much again* as "an additional amount equal to that mentioned, twice as much", and *half as much again* as "an additional amount equal to half that mentioned, one-and-a-half times as much", and it includes examples from 1523 through 2005.

The "default" use of *again*, or the one that has been the focus of a lot of research, is the one that repeats or restores eventualities. Traditionally the analysis has been that *again* has the presupposition that this event has occurred before or this state has held before. However the degree-addition use of *again* has no presupposition of a prior eventuality. To look at an eventive example for clarity, (44b) is perfectly felicitous if the speaker has never ran any miles before, requiring only that there be another degree to compare it with (the expected number of miles she would run) and not requiring a previous mile-running event. In Feldscher (2017b), I provided a denotation for additive *again* that works with the structure in (47). While the denotation does not in any way rely on the presence of the factor phrase *half*, additive *again* appears with significantly greater frequency with a factor phrase than in any other environment. In an effort to ensure that additive *again* worked cohesively with factor phrases, it was built to work with the framework that Gobeski (2011) works in for his analysis of factor phrases, along with his ensuring assumptions about the structure of the

comparative. This structure is also compatible with a dialect that accepts *A is as tall again as B* as grammatical. If working with a different theory of the structure of the comparative, an analysis of additive *again* should be adaptable for any theory with an analysis of optional factor phrases. As I take the stance that all of my data revolves around addition, rather than multiplication, I do not further investigate multiplication in this dissertation, so for further discussion of *half* and other multiplicative factor phrases, or multiplication in semantics, see Gobeski (2011). The analysis from Feldscher (2017b) merged Gobeski's syntax for *half as tall* with a type system including eventualities for *again*, resulting in the structure in (47).

(47)   half as tall again as Pansy
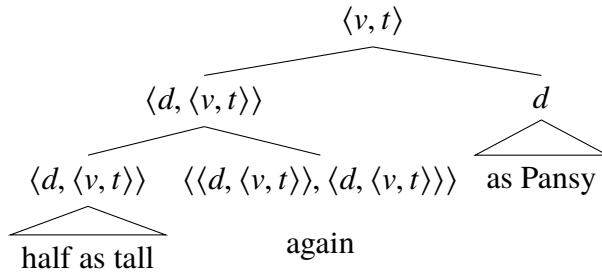
I assigned *again* a modifier type like Gobeski's type for *half*, although it is a type for a system with eventualities, rather than the modifier type in Gobeski's original system. What additive *again* then needs to accomplish in this particular case is to assert that the eventuality this sentence describes, one of height, will have the measure that adds up to Pansy's height plus half of Pansy's height. So it will explicitly reference degree addition with the + operator, and the measure of eventualities, where the measure function is written as $\mu(v)$. Feldscher (2017b) assumes that the degree for half of Pansy's height can be accessed by getting the measure of a state of being half her height, since there is no degree already present in the structure for it, as there is for Pansy's actual height. In order to accomplish this, their denotation for additive *again* uses the symbol $\approx$ to write the relation indicating that the two eventualities it links are ones of the same type. In this example, this would be states of height. The actual denotation given for additive *again* is in (48), followed by a sample computation for the phrase and tree in (47).

(48) $[\![\text{again}_{\text{ADD}}]\!] = \lambda f_{\langle d, \langle v, t \rangle \rangle} \lambda d \lambda v. \exists v'[v \approx v' \wedge f(d)(v') \wedge \mu(v) = \mu(v') + d]$

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The denotation takes in something of the functional type of either *half as tall* or *as tall*, and then calls for a degree and then an eventuality, and says that there exists another degree and eventuality d' and v'. The first conjunct uses a similarity relation to state that these two eventualities are of the same type. So in (47), they are both eventualities (states) of tallness. The second conjunct says that the local function holds of the local degree and the existentially quantified eventuality v'. The third conjunct is where two degrees are added to get the measure of the local eventuality. To make this clearer, consider (49), where I have stepped through the computation for the whole of *half again as tall as Pansy* according to the tree in (47).

(49)   a. $[\![\text{again}_{\text{ADD}}]\!] = \lambda f_{\langle d, \langle v,t \rangle\rangle} \lambda d \lambda v . \exists v' [v \approx v' \wedge f(d)(v') \wedge \mu(v) = \mu(v') + d]$

     b. $[\![\text{half as tall}]\!] = \lambda d' . \lambda v'' [\text{tall}(v'') \wedge \mu(v'') = \frac{1}{2}d']$

     c. $[\![\text{again}]\!]([\![\text{half as tall}]\!]) = \lambda d . \lambda v . \exists v' [v \approx v' \wedge \underline{\lambda d' . \lambda v'' [\text{tall}(v'') \wedge \mu(v'') = \frac{1}{2}d'](d)(v')} \wedge$
       $\mu(v) = \mu(v') + d]$

     d. $[\![\text{half as tall again}]\!] = \lambda d . \lambda v . \exists v' [\text{tall}(v) \wedge \underline{\text{tall}(v') \wedge \mu(v') = \frac{1}{2}d} \wedge \mu(v) = \frac{1}{2}d + d]$

     e. $[\![\text{half as tall again}]\!]([\![\text{as Pansy}]\!]) = \lambda v . \exists v' [\text{tall}(v) \wedge \underline{\text{tall}(v') \wedge \mu(v') = \frac{1}{2}d_{\text{Pansy}}} \wedge \mu(v) =$
       $\frac{1}{2}d_{\text{Pansy}} + d_{\text{Pansy}}]$

     f.   = a property of eventualities, holding of states of tallness measuring one and a half times Pansy's height

In the further computation in (49), (a) repeats the denotation for additive *again*, and (b) is what it merges with, a state of being half as tall as d. In step (c), *again* takes *half as tall* as an argument. The first conjunct of additive *again*, before the underline, ensures that the eventuality described by the given sentence is also a state of tallness. In line (d), this is expressed by replacing this conjunct with one directly stating that the local eventuality v is a state of tallness. Looking back to line (c), the underlined section is the contribution of *half as tall* where additive *again* repeats it wholesale. This is simplified in the underlined portion of line (d), where it asserts that v' is a state of tallness, with a measure of half of d, which line (e) introduces as Pansy's height. It is worth noting that v' is existentially quantified, and it will gain no other qualifications within the sentence at this point.

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Therefore these assertions about v' are vacuously true as long as the state of being half as tall as Pansy exists. There is no requirement that anyone be the bearer of this state, for example. The final conjunct in (c) introduces the degree addition in the measure of the local eventuality directly. Line (d) introduces the measure of v' as half of d, which line (e) introduces as being the degree of Pansy's height. As a result, the whole thing describes a property of eventualities which holds of states of tallness measuring one and a half times Pansy's height. This successfully replicates the meaning of this phrase.

This effectively does the opposite of my expected analysis for *more* here, in that it takes a morpheme that repeats events (comparable to adding events) and makes it into a construction that adds degrees. My hypothesis is that the event summing reading of the additive expressions as a whole can be compositionally built from the degree addition reading. This is because the existence of additive *again* is dialectal; while every speaker of English has an eventive *again*, many do not have a degree *again*. In contrast, the additive expressions unilaterally have both readings. I take this mismatch as evidence that the additive expressions should be analyzed as being compositionally built from a degree addition reading to an event summing reading. The reverse direction is not guaranteed, otherwise we would expect additive *again* to be present in all dialects of English instead of a few. This non-compositional analysis that I have presented here is not contradictory in that it makes no unfulfilled predictions that all event related words should have degree interpretations as well.

To preview some related data, *again* is not the only word that typically appears with event constructions relating to event time that seems to have links to degree constructions. What have been called aspectual particles also appear in degree constructions, looking to give other evidence of a link between degree semantics and event semantics. In addition to additive *again*, consider the use of aspectual particles in comparatives in (50)-(52).

(50)   Andrew graded six papers. I graded **still** more.

(51)   Andrew graded six papers. I graded **yet** more.

(52)   Berta ist **noch** größer als Adam.   (from Umbach (2012))

      'Berta is even taller than Adam.'

Feldscher (2017b) provides an analysis for the dialectal degree addition use of *again* described in this section, but data like (50) and (51), and (52) shows that this pattern of aspectual particles appearing in comparatives is cross-linguistic, indicating there may a greater link between degree constructions and event constructions to be explored. This data and related puzzles will be returned to later in Chapter 4.

2.3.3   An analysis of *more*

To finally get to an analysis of *more* itself, I propose an analysis that accounts for the ambiguity of *more* by building an event summing reading from a degree addition base. This directionality is both on the strength of the pattern of ambiguity observed by Thomas (2017), and on the analysis of additive *again* that I just gave. In addition to *more*'s robust cross-categorical ambiguity, both readings have a shared thread of meaning, which can be characterized as addition. In terms of the typical comparative use, $A > B$ can be reframed as $A \geq B + C$, where C is a positive nonzero amount, and this small reframing allows us to construe the comparative as degree addition. The event summing reading also has an element of degree addition in a slightly different way. As a reminder, consider the following data.

(53)   I graded **three more papers** than John.   (*I graded $d_{J.paper} + 3$ papers.*)

(54)   Andrew and I have to grade all ten of these papers. He graded six papers, so when I grade
      four more (papers) we will be done.   (*10 total, 6 for him, 4 for me*)

Again, (53) shows typical degree addition, where *three more papers than John* is the number John graded plus 3. However, in (54), *four more papers* does not mean that I graded 6+4, but rather it only means that I graded 4. Instead, this sums Andrew's paper grading event with my paper grading event, to make a superevent of both of us grading papers. The event summing reading involves adding two degrees, but degree addition involved is that the superevent measures 6+4

paper gradings. What an analysis here needs to do is to link how *more* adds two degrees to get the measure of one event for the comparative / degree addition reading, but sums two events (along the way adding the two degrees to get the measure of the *superevent*) for the event summing reading. Following the analytical direction proposed for additive *again* in Feldscher (2017a) and reviewed previously, I propose to compositionally build event summing from degree addition.

2.3.3.1 Viewing comparative *more* as degree addition

As previously mentioned, the comparative can already be thought of as involving addition, if we think about what math we need to do to interpret it. Below I repeat the denotation adapted from Wellwood's denotation for the basic comparative repeated in (55), and then in (56) I rephrase it slightly so as to overtly incorporate addition. The comparative is usually thought of as saying A>B. The change I propose is mathematically equivalent: A>B iff A=(B plus some positive, nonzero number).[4]

(55) $[\![\text{more}_\mu]\!] = \lambda d \lambda \alpha . \mu(\alpha) > d$

(56) $[\![\text{more}_\mu]\!] = \lambda d \lambda \alpha \exists d'. \mu(\alpha) \geq d + d'$

Here I use $\geq$ rather than =, in order to account for the fact that we can say *Alex is 2 inches taller than Danni* if Alex is exactly 2 inches taller, but also if they are 3 inches taller. This should be uncontroversial, but the important change was that (56) now explicitly includes addition of two degrees. Another argument in favor of reconsidering the typical comparative morpheme to involve

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[4]Note that this *must* be a positive, nonzero degree, so this is an ontological assumption about what is assumed for degrees. This restriction could go in the denotation of *more* instead, but doing so indicates that we expect natural language to deal with either zeros or negative numbers in other places. While sentences with such are perfectly understandable, they do not sound appropriate in a non-joking context.

i. # Alex is negative three inches taller than Cameron.

ii. # A unicorn is zero inches tall, because it doesn't exist.

Based on the absence of sentences involving zeros or negatives that sound serious instead of like math jokes, I assume here that I don't need to specify that degrees be positive and nonzero in a presupposition or anything, but rather we can assume this to be a characteristic of degrees.

addition comes from differential comparatives, which explicit reference a differential degree (von Stechow, 1984).

(57)   Neville is three inches taller than Pansy. $\qquad\qquad\qquad d_N \geq (d_P + 3)$

The presence of two local degrees in (57), *three inches* and *than Pansy*, means that differential versions of the comparative requires addition. This minimally changes the denotation for a differential *more* to the denotation in (58), which calls for two degrees locally and adds them.

(58) $[\![\text{more}_\mu]\!] = \lambda d \lambda d' \lambda \alpha . \mu(\alpha) \geq d + d'$

Schwarzchild & Wilkinson (2002) make an argument to unify the comparative morpheme used in differentials (requiring two degrees) with the one used in cases with only one local degree. They follow the same mathematical reasoning that A > B iff A = (B + something). Working in an interval-based semantics to express this intuition, they propose a covert SOME which expresses the "some positive amount / degree" part of this intuition. In non-differential comparatives, instead of the overt differential degree SOME appears instead. This allows the differential and non-differential comparatives to both call for two degree / interval arguments, making the two instances of the comparative *more* unifiable to one morpheme. This gives the two comparatives a parallel visible in (59) and (60).

(59)   Neville is three inches taller than Pansy. $\qquad\qquad\qquad d_N \geq d_P + 3$

(60)   Neville is SOME taller than Pansy. $d_N \geq d_P + d$ (where d is a positive, nonzero degree)

Because it matches the intuition that the comparative involves degree addition, and rather than ensure my analysis works with two different comparative *more* morphemes of different types, I follow Schwarzchild & Wilkinson in my analysis in unifying both versions of the comparative to one morpheme, and assuming something like their covert SOME applies with non-differential cases. Thus from this point, the denotation for *more* that I will be working with is the differential one from (58). As their SOME is formulated for a theory working with intervals instead of degrees, I do not directly borrow their denotation. I assume there exists a similar formulation possible for degrees,

which would reflect their intuitions relating the quantifier *some* to this use in a nondifferential comparative, but I do not attempt to formulate it here. Instead, I will simplify by treating it for now as simply denoting some degree *d*, and assigning it the type *d*. While almost certainly a simplification, further exploring this question steps slightly away from this section's goal. At this point, the intuition that the comparative denotes (degree) addition is realized analytically.

2.3.3.2   Constructing event summing

In this section I build the event summing reading from the degree addition reading, in order to explain why English has a natural class of additive expressions, where if they have a degree addition reading they also have the event summing reading. In order to fully explain this robust ambiguity, I posit that a separate morpheme, what I'm calling E-SUM, creates an event summing reading when merged with a degree addition expression, rather than proposing that each additive expression has a homophonous degree addition morpheme and event summing morpheme.

In most cases, unless there are heavy contextual hints, *more* is ambiguous between either reading. For example, while this example below attempts to use context to push the event summing reading as the intended meaning by stating a five mile goal, the following sentence is still ambiguous, and a degree addition reading is still possible.

(61)   Bill and I are doing a relay race together. He ran two miles, and I ran **three more**, so we

hit the goal of five miles.   ✓ (*5 miles total, 3 for me*)

✓ (*more than the goal, 7 miles total, 5 for me*)

However, one way to unambiguously create the degree addition reading is crucial to my analysis. As previously mentioned, the addition of a standard degree in an overt *than* phrase blocks the event summing reading. This data is repeated in (62b), which only has a degree addition interpretation.

(62)   Bill ran two miles...

    a. and I ran three mile more.   (*I ran 5 OR 3*)

    b. and I ran three miles more **than Bill ran**.   (*I ran 5 NOT 3*)

Given that E-SUM must take an argument of type $\langle d, \langle d\langle v, t\rangle\rangle\rangle$, the appearance of a *than* phrase type-wise blocks the E-SUM morpheme. That is, if a *than*-phrase has appeared within the DegP and saturated one of its degree arguments, there will be no node of type $\langle d, \langle d\langle v, t\rangle\rangle\rangle$ for E-SUM to take as an argument. This leads me to propose that E-SUM applies to a DegP of type $\langle d, \langle d\langle v, t\rangle\rangle\rangle$. it must apply before any *than*-phrase can, as after *more* combines with a *than*-phrase the result is type $\langle d, \langle v, t\rangle\rangle$. In (63) I show Wellwood's tree for comparative *more* / standard degree addition, adapted to the sentence from (62). In (64), the same structure appears, but instead of a *than*-phrase, we see the event-summing morpheme E-SUM, which I have labeled as the Add head of the Additive Phrase, taking the DegP *more* as an argument.

(63)   Degree addition (Wellwood, 2015)

```
                        VP
                       ⟨v,t⟩
              ┌──────────┴──────────┐
              V                    DegP
            ⟨v,t⟩                  ⟨v,t⟩
             run          ┌──────────┴──────────┐
                         MP                    Deg′
                          d               ⟨d,⟨v,t⟩⟩
                       3-miles         ┌───────┴───────┐
                                      Deg              d
                                ⟨d,⟨d,⟨v,t⟩⟩⟩       thanP
                                     more
```

(64) Event summing

```
                        VP
                      ⟨v, t⟩
            ┌───────────┴───────────┐
            V                       AddP
          ⟨v, t⟩                   ⟨v, t⟩
           run            ┌──────────┴──────────┐
                          MP                    Add′
                          d                  ⟨d, ⟨v, t⟩⟩
                       3-miles          ┌────────┴────────┐
                                        Add              DegP
                              ⟨⟨d, ⟨d, ⟨v, t⟩⟩⟩,    ⟨d, ⟨d, ⟨v, t⟩⟩⟩
                                 ⟨d, ⟨v, t⟩⟩⟩           more
                                  E-SUM
```
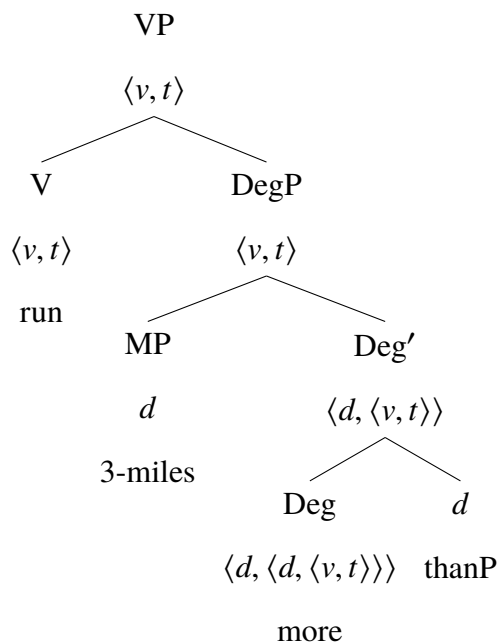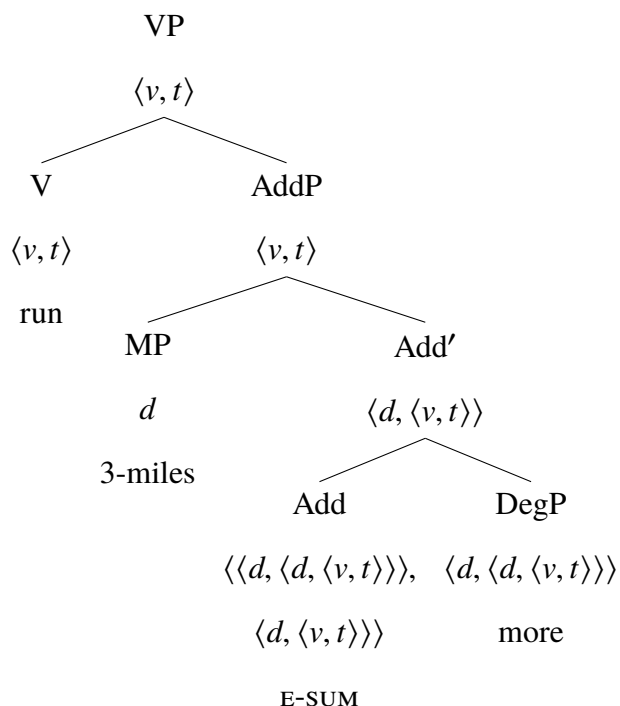
What Greenberg and Thomas accomplished with their incremental *more* denotations must be accomplished by applying the E-SUM morpheme to *more*. As a reminder, the event summing reading requires (1) the local degree must measure the local event (truth-conditionally), (2) there must be a non-local event that can be measured and can be summed with the local event, and (3) the measure of the super event is the sum of the measure of the local and non-local events. The part that is definitely asserted is the measure of the matrix eventuality. Its falseness can be objected to with a direct "no", as in (65).

(65)   A: Bill ran two miles, and I ran three more.

      B: That's not true, you only ran one more!

In contrast, the ability to sum the local eventuality with a non-local eventuality is less clear in what it is. Greenberg calls it as a presupposition, but Thomas argues that it is asserted, as reviewed previously. The non-local event is modeled as asserted by Greenberg (2010); Thomas (2010), but as a presupposed QUD in the analysis of *another* by Thomas (2011). Based on these pieces, here is the denotation I propose for the event summing E-SUM in (66).

(66) $[\![\text{E-SUM}_v]\!] = \lambda f_{\langle d, \langle d, \langle v,t \rangle \rangle \rangle} \lambda d \lambda v'[\mu(v') = d \wedge f(\mu(v))(d)(v \oplus v')]$

$[\![\text{E-SUM}_v]\!]([\![\text{more}_\mu]\!]) = \lambda d \lambda v'[\mu(v') = d \wedge \mu(v \oplus v') = d + \mu(v)]$

The event-summing morpheme E-SUM references a contextually relevant eventuality v. This is a shorter version of Greenberg and Thomas's presuppositions and QUD conditions. Like a pronoun refers back to an individual in the discourse, this similarly references an eventuality in the discourse. In this denotation, E-SUM first takes in a thing of type *more*, which produces the second line in (66). The event summing morpheme E-SUM builds in the event summing with the $\oplus$ operator, but the degree addition of *more* contributes the part of the truth conditions that the addition of the measures of the subeventualities make the measure of the supereventuality. The two asserted conjuncts of this morpheme are that the local eventuality v' measures d, and that the measure of summed eventualities is the measure of the local eventuality (d) plus the measure of the non-local eventuality v.

To continue the sample computation, it may be clearer to assume an example eventuality for v in the computation. In (67), information for the contextually relevant non-local event v is included, but underlined to set it off from the rest of the computation as being not actually present. In this example, if we're talking about how Bill ran the first 2 miles of the 5 mile relay, and I ran **three more**, we can assume the underlined parts in the following version.

(67) $[\![\text{E-SUM}_v \ \text{more}_\mu]\!] = \lambda d \lambda v'[\mu(v') = d \wedge \mu(\underline{v_{B-run}} \oplus v') = d + \underline{\text{2-mi}}]$

$[\![\text{3-miles} \ \text{E-SUM}_v \ \text{more}_\mu]\!] = \lambda v'[\mu(v') = \text{3-mi} \wedge \mu(\underline{v_{B-run}} \oplus v') = \text{3-mi} + \underline{\text{2-mi}}]$

$[\![\text{run 3-miles} \ \text{E-SUM}_v \ \text{more}_\mu]\!] = \lambda v'[\textbf{run}(v') \wedge \mu(v') = \text{3-mi} \wedge \mu(\underline{v_{B-run}} \oplus v') = \text{3-mi} + \underline{\text{2-mi}}]$

In (67), the underlined portions are the information that v should convey if we assume v to be the event where Bill ran the first 2 miles of the 5 mile relay. Now that we have two degrees visible, it is clear how the addition happens. At the end of this computation, the truth conditions are that the local event is one of running, it measures three miles long, and that this event summed with the contextually relevant non-local event measures 5 miles long. Thus it reaches the correct truth

conditions, and the event summing reading is directly enabled by the presence of degree addition in the morpheme that E-SUM applies to.

2.3.3.3 Side notes on addition and summing

The unacceptability of certain sentences has the potential to shed light on the conceptualization of how we add either degrees or events. For example, if events are to be summed, they must be the same type. In (68), *things* is acceptable because it creates a superset eventuality type that includes the original eventuality type. Book-readings count as thing-readings, but *magazines* is not acceptable because book-readings and magazine-readings are different. Both can count as thing-readings, as shown in (69, 70), but in (68) they are not explicitly grouped as thing-readings, and therefore cannot be added.

(68)   I read one book last weekend and next weekend I think I'll read two more $\left\{ \begin{array}{l} \text{things} \\ \text{*magazines} \end{array} \right\}$.

(69)   This weekend I read one book and two magazines, and next weekend I think I'll read two more things.

(70)   Alex: I read a book today.

Brady: Oh, you should read more things than that.

Alex: Well tomorrow I'll read a book and two more magazines then!

Similarly, in (71), a running event and a swimming event can be added, but only when grouped as exercising events. This mirrors the evidence Thomas (2011) provides for his "additive *another*". The explicit QUD establishes a way to group the eventualities so that they can be summed.

(71)   Alex: How much did you exercise today?

Brady: I ran two miles this morning, and swam half a mile more this afternoon.

Schwarzschild (2006) shows that measure phrases must be monotonic on the mereology of the event or individual being measured in the case of partitives, as I previously discussed in my review

of Wellwood's DegP. It logically follows that if a measure is not monotonic on the mereology of the eventuality or individual and cannot measure an amount of it, it will not be possible to use that measure to then add amounts of that individual or eventuality. This is why (72) is ungrammatical; the temperature of the water cannot be mapped onto the part-whole structure of the water, and if the measure phrase cannot be used to add amounts of a thing if it cannot be used to measure amounts of a thing to start with.

(72)   * After Bill poured coffee, I poured 10 degrees more water.

All in all, this analysis works with the English data so far, but there is cross-linguistic data not yet accounted for. As was previewed in Greenberg's Hebrew data, in other languages, this event summing is done using the same word as that the language uses for event continuation (*still* in English), indicating that there is an a link between those two meanings, just as there is a link between degree addition and event summing. The following German data is from Umbach (2012) and provides another example of this.

(73)   Es regnet **noch**.
       'It's **still** raining.'

(74)   Otto hat **noch** einen Schnaps getrunken.
       'Otto had a schnaps in addition.' / 'Otto had another schnaps.'

Glossing over some details Umbach (2012) discusses about stress, (73) and (74) show this homophony in German between the *noch* use for event continuation (*still*) and the event summing use discussed previously. Other data from Thomas (2017) supports this link, with either this pattern of homophony or with languages like Romanian where all three of these meanings are achieved with the same word. As indicated by this pattern of homophony, in order to extend this analysis compositionally, continuation must be built up from event summing as event summing was built up from degree addition. This data supports a relationship where event structures contain degree structure, but it does not weigh in on whether event structure *necessarily* or *optionally* contain

degree structure. Specifically, this data presents degrees as potentially building up the event time information part of the event structure, or the aspect.

One other aspect of this data worth dwelling on is that *still* is an aspectual/iterative particle in its prototypical use. The above data does have this iterative meaning, but in Chapter 4, I will discuss several instances of aspectual particles appearing in degree constructions with degree meanings instead of aspectual meanings. The relationship between event time and degrees is clearly present, but at this time its exact nature is still opaque.

2.4   Case study 2: additive adjectives

The less well studied case of degree words being used for event summing is the case of other additive expressions. Here I will focus on additive adjectives, for syntactic simplicity, and provide an analysis of them in order to show that the analysis for *more* can be extended. Feldscher (2017a) names adjectives like *additional* or *extra* "additive adjectives" because, like *more*, they can be interpreted as degree addition or as event summing, given the right context. To repeat the data from before as a reminder, here are example sentences with additive adjectives showing the same ambiguity as *more*.

(75)   a. I can run much further than Bill can. He can run three miles in one go, but I can run **an additional two** (compared to him).   (*5 in one go*)

   b. My weekly running goal is five miles. I ran three miles yesterday, and then ran **an additional two** today, so I hit my goal.   (*2 today, 5 total*)

(76)   a. I can run much further than Bill can. He can run three miles in one go, but I can run **an extra two** (compared to him).   (*5 in one go*)

   b. My weekly running goal is five miles. I hit my goal yesterday, and then ran just **one extra mile** today, so I surpassed my goal.   (*1 today, 6 total*)

In (75) and (76), both of the (a) examples are constructed with context intended to push the degree addition reading, paralleling the comparative *more*. Both of the (b) examples are constructed

with context intended to favor the event summing reading, showing that the same ambiguity as *more* has appears for these adjectives too. While I am keeping the label "additive adjectives" here, they might not function differently from the more syntactically complex additive constructions, so this label shouldn't be interpreted as asserting that they're different. However, the easiest examples for the next step of this analysis are syntactically simple adjectives before more complex phrases. In addition to prepositional phrases being clearly more complex, data like *a whole nother kettle of fish* suggests that *another* may be a complex determiner broken down as *an+other*, as well, so I am not going to analyze that one at this time either. Here I will extend my analysis of *more* to only the purely adjectival example *additional*, rather than complicate matters with determiners, prepositions, or other phrases. Additionally, one other reason to step through an analysis of *more* and *additional* specifically is that these two morphemes are ones that we will see return in Chapter 3, the chapter on discourse addition. Although none of the types of addition I examine works only with these two morphemes, these two appear with every type I examine. After extending this analysis from *more* to *additional*, I hypothesize that the analysis of more complicated additive constructions should be parallel to this one, albeit with a few more moving pieces.

Additive adjectives like *additional* are not syntactically interchangeable with *more*, but rather they should be analyzed as adjectives that have denotations that parallel the Deg head *more*. As (76) and (75) earlier showed, they appear in the Adj position between a determiner and a noun. Additionally, they can follow the copula *be* although they are clumsy after *seem*, as shown here in (77), likely because *seem* is sensitive to gradable adjectives and these are not gradable.

(77) a. I discarded the fifty third card because it $\left\{ \begin{array}{c} \text{was} \\ {}^?\text{seemed} \end{array} \right\}$ additional.

b. I discarded the fifty third card because it $\left\{ \begin{array}{c} \text{was} \\ {}^?\text{seemed} \end{array} \right\}$ extra.

Finally, the *-ly* suffix that attaches to adjectives to create adverbs (*rude-ly*, *wise-ly*, *frank-ly*, etc.) attaches to *additional* to create *additionally*. We can safely assume *additional* and other members of its class are adjectives with a semantics like that of *more*, rather than stray Deg heads requiring

a syntactic explanation of where the comparative is appearing.

Assuming only minor differences between *more* and *additional* means the same analysis can be extended fairly smoothly. Most of the differences we walked through earlier in Section 2.3.1 could be attributed to *more* appearing in DegPs and *additional* appearing in Adj positions, although relevant differences will be reviewed as necessary in the following sections. Minimally, both must have degree addition capability, but we can hypothesize that E-SUM is compatible with multiple syntactic types as long as they have the right semantic requirements.

2.4.1 Event summing analysis

I will begin this analysis with the event summing reading instead of with degree addition. To review data from before, *more* can appear with an optional *than* phrase, as shown by (78), but additive adjectives *additional* and *extra* cannot appear with a *than* phrase, as shown in (79). However, as (80) shows, event summing for *more* is blocked by a *than* phrase.

(78)   Today I ran two miles more (than I ran yesterday).

(79)   Today I ran an $\left\{ \begin{array}{c} \text{additional} \\ \text{extra} \end{array} \right\}$ two miles $\left\{ \begin{array}{c} \text{*then I ran yesterday} \\ \text{*from what I ran yesterday} \end{array} \right\}$.

(80)   Yesterday I ran 2 miles, and today I ran more than I ran yesterday.

$\checkmark$ (*Degree addition - I ran > 2*)

χ (*Event summing - I continued running*)

Given that additive adjectives can't appear with a *than*-phrase, it instead makes sense to work from the starting point of the event summing analysis proposed for *more* so that we can assume that E-SUM appears in the structure in lieu of a *than*-phrase. Recall also that additive adjectives are heavily restricted in what determiners they can appear with, some evidence of which is repeated in (81).

(81) I ran $\left\{\begin{array}{l} \text{*∅} \\ \text{an} \\ \text{the (\textit{only w/context})} \\ \text{that/those (\textit{only w/context})} \\ \text{*some} \end{array}\right\}$ $\left\{\begin{array}{l} \text{additional} \\ \text{extra} \end{array}\right\}$ 3 miles.

Definite determiners are only allowed when anaphoric to some specific amount in the context, but the simplest case seems to be the indefinite *an*, which I can assume for simplicity is uninterpreted. To the end of explaining a parallel between *more* and additive adjectives, the tree proposed for event summing with *more* is repeated below, followed by a minimally changed version which is adapted to event summing with *additional*.

(82) Event summing with *more*

(tree diagram)

VP
$\langle v, t \rangle$

V AddP
$\langle v, t \rangle$ $\langle v, t \rangle$
run
  MP Add′
  d $\langle d, \langle v, t \rangle \rangle$
  3-miles
    Add DegP
    $\langle \langle d, \langle d, \langle v, t \rangle \rangle \rangle,$ $\langle d, \langle d, \langle v, t \rangle \rangle \rangle$
    $\langle d, \langle v, t \rangle \rangle \rangle$ more
    E-SUM

45

(83) Event summing with *additional*

VP
$\langle v, t \rangle$

V $\langle v, t \rangle$
run

DP $\langle v, t \rangle$

D
an

AddP $\langle v, t \rangle$

Add' $\langle d, \langle v, t \rangle \rangle$

MP d
3-miles

Add
$\langle \langle d, \langle d, \langle v, t \rangle \rangle \rangle,$
$\langle d, \langle v, t \rangle \rangle \rangle$
E-SUM
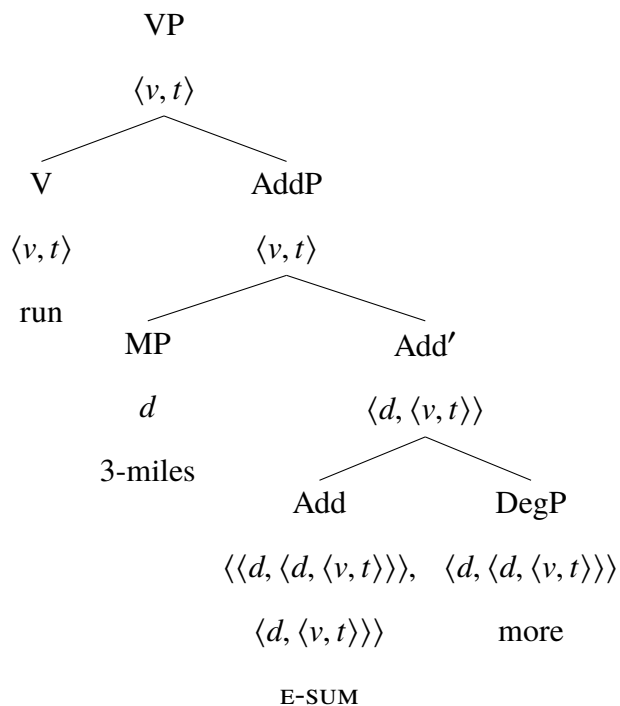
AdjP $\langle d, \langle d, \langle v, t \rangle \rangle \rangle$
additional
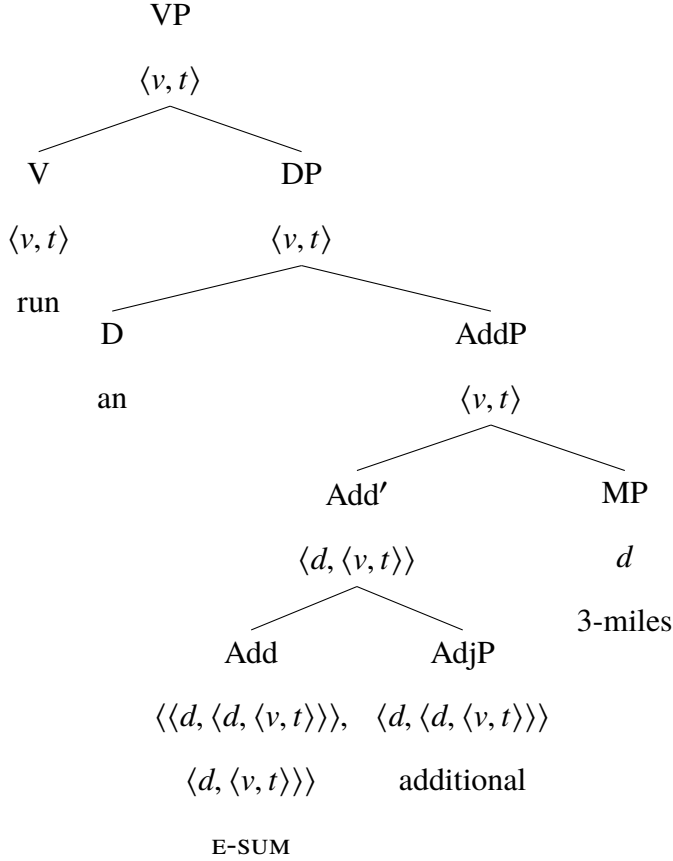
Here I have given the adjective phrase *additional* the same semantic type as *more*, and assumed that the determiner *an* is uninterpreted. As a result, the exact same types work for the adjectival structure as for the comparative, with the event summing morpheme E-SUM again merging with the phrase in question, before merging with the measure phrase. In (84), the denotation used for *more* is repeated, so it can be seen that the same denotation is given for *additional* here. As the denotations are the same as in the analysis of *more*, it follows that the computation would be the same as well, so the computation in (85) is only shown through the Add' layer, rather than repeat the whole computation from Section 2.3.3.2.

(84) $\llbracket \text{more}_\mu \rrbracket = \lambda d \lambda d' \lambda \alpha . \mu(\alpha) \geq d + d'$

$\llbracket \text{additional}_\mu \rrbracket = \lambda d \lambda d' \lambda \alpha . \mu(\alpha) \geq d + d'$

(85) $\llbracket \text{E-SUM}_v \rrbracket = \lambda f_{\langle d, \langle d, \langle v, t \rangle \rangle \rangle} \lambda d \lambda v' [\mu(v') = d \land f(\mu(v))(d)(v \oplus v')]$

$\llbracket \text{E-SUM}_v \rrbracket (\llbracket \text{additional}_\mu \rrbracket) = \lambda d \lambda v' [\mu(v') = d \land \mu(v \oplus v') = d + \mu(v)]$

The above denotation, when given a degree and the local eventuality in the sentence, will assert that the measure of the local eventuality is equal to that degree, and that the measure of the local and the non-local contextually relevant eventualities summed together is equal to that degree plus the measure of the non-local eventuality. This is the same result as we saw in the *more* analysis, and it accurately reflects the truth conditions of additive adjectives.
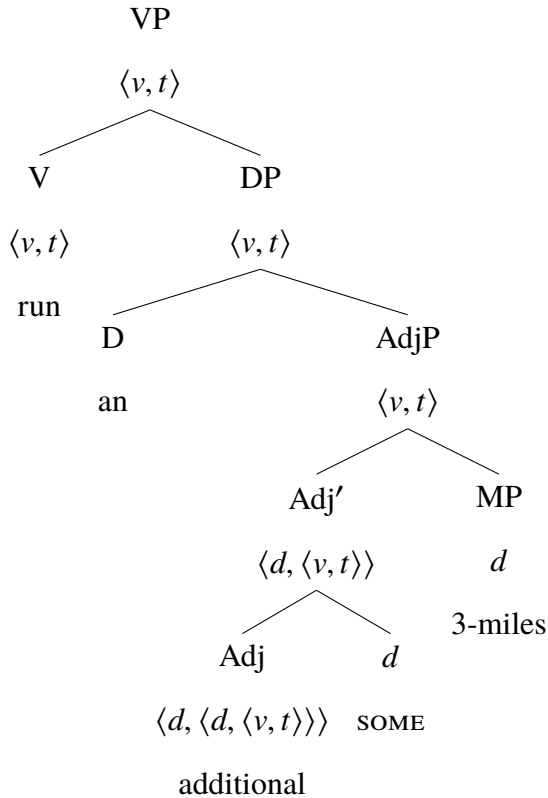
In support of assigning additive adjectives the same denotation as *more*, we cannot build something like E-SUM into their denotation directly because they have a degree addition reading too, not just eventuality summing. So we have to build the event summing reading compositionally in the same way we did for *more*. To add a parsimony argument in favor of giving *additional* the same denotation as *more*, if we give the same denotation for either morpheme, then we definitely do not need to posit different event summing morphemes to work with different syntactic categories of additive expressions. This allows the same E-SUM morpheme, rather than multiple silent morphemes. It is worth pointing out that *additional* and *extra* do not convey precisely the same meaning, and we probably do not want to assign every morpheme that participates in this ambiguity precisely the same denotation. However, it's equally worth pointing out that unraveling the intricacies of the precise differences between each of these adjectives of phrases is outside the scope of this study at this time. Instead, the goal is to lay out a framework in which additive adjectives (and possibly more syntactically complex phrases) display the same ambiguity as *more* does, with a minimal but explanatory analysis, and that this section's analysis successfully makes progress toward that goal.

2.4.2   Degree addition analysis

Now that we have a working event summing analysis for additive adjectives, we can work backward to get degree addition from this event summing structure by removing E-SUM from the structure, as in (86). In lieu of E-SUM taking *additional* as an argument, *additional* can, like *more*, take two degree arguments to add them. As additive adjectives cannot take a standard phrase or a *than*-phrase, this does therefore mean that there can only be one overt degree argument. I favor

a parsimonious analysis that does not assume that morphemes that do degree addition have two homophonous versions: $\langle d, \langle d, \langle v, t \rangle \rangle \rangle$ and $\langle d, \langle v, t \rangle \rangle$. Instead, I propose the tree in (86), which maintains the same type for *additional* as in the event summing analysis.

(86) I ran **an additional 3 miles**.

```
                    VP
                  ⟨v,t⟩
              /          \
            V              DP
          ⟨v,t⟩          ⟨v,t⟩
          run          /       \
                      D          AdjP
                      an        ⟨v,t⟩
                              /        \
                            Adj′         MP
                          ⟨d,⟨v,t⟩⟩       d
                          /      \      3-miles
                        Adj       d
                   ⟨d,⟨d,⟨v,t⟩⟩⟩   SOME
                     additional
```

In the tree in (86), there is still only one overt degree argument, so following the precedent from Schwarzchild & Wilkinson (2002), I substituted E-SUM with a silent morpheme SOME in order to maintain the required types. As a reminder, I am not directly following their theory, as they work with intervals, but rather I am assuming it to act like a degree in this theory for convenience. This preserves the overtly homophonous sentence but also results in the truth conditions that I ran three miles plus some amount more running. In fact, if we parsimoniously do not change the type of *additional* to only call for one degree argument, something like SOME *must* be used here in lieu of E-SUM, as there cannot be two overt degree arguments here. With the comparative, both the measure phrase and the *than* phrase are optionally overt or covert, as shown in (87). But with *additional*, the measure phrase is optionally overt and an overt *than* phrase is prohibited, as shown in (88).

(87) a.   Today I ran 3 miles more than I ran yesterday.

      b.   Today I ran 3 miles more.

      c.   Today I ran more than I ran yesterday.

      d.   Today I ran more.

(88) a.   * Today I ran an additional 3 miles than I ran yesterday.[5]

      b.   Today I ran an additional 3 miles.

      c.   * Today I ran additional miles than I ran yesterday.
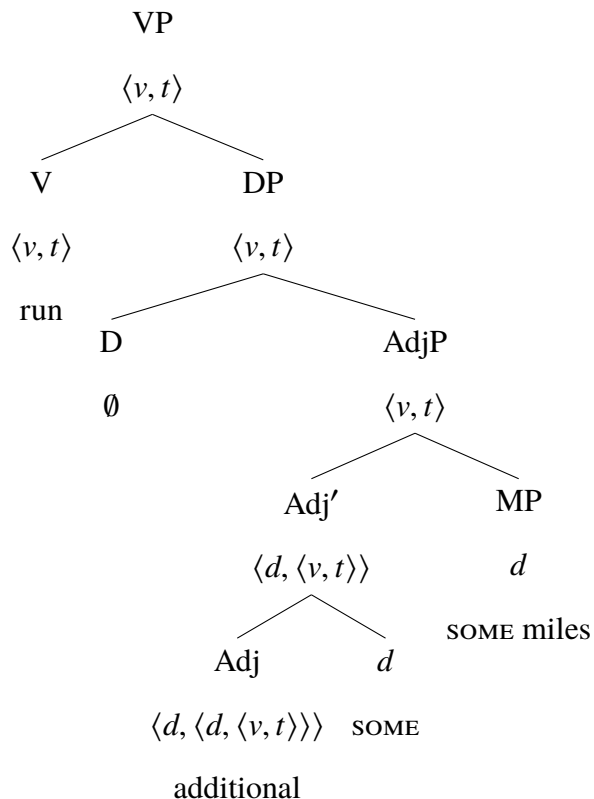
      d.   Today I ran additional miles.

For *more*, we condensed all of the cases to an analysis assuming two degree arguments, and relying on SOME to account for covert arguments. As just shown, this is doable for additive adjectives as well. Even though additive adjectives never show up with two overt degree arguments, keeping their analysis the same as that of *more* is still more parsimonious, allowing for the same event summing morpheme to be used in both analyses. Given that the additive ambiguity is present both with and without an overt measure phrase, positing multiple degree addition morphemes depending on the number of overt arguments would mean that we would *also* have to posit multiple event summing morphemes to build that reading from the multiple degree addition morphemes. So if additive adjectives call for the same number of degree arguments that *more* calls for, the same event summing morpheme should suffice for both. Additionally, as previously discussed, an overt *than* phrase blocks the event summing reading for *more*, which I argued resulted from a type clash. If there were a *more* that was used with one overt degree argument and a *more* that was used with two overt degree arguments, a new explanation would be needed for why a degree argument in the form of a measure phrase doesn't block event summing but a degree argument in the form of a *than* phrase does.

---

[5]It does seem acceptable to say *Today I ran an additional three miles on top of what I ran yesterday*, but that includes two additive expressions, not just the one. While data including more than one additive expression should be considered, here I am not yet considering it.

Following this argument for one *more* and one *additional* morpheme, both with the same type calling for two degree arguments, there is no semantic reason for a *than* phrase to be blocked for additive adjectives. Given that it is blocked regardless, this means that something like SOME, a covert morpheme supplying some positive, nonzero degree, must be available for the degree addition reading of *additional*. In fact, it is essentially mandatory, as all additive expressions in this theory call for two degree arguments, type-wise, and if the *than*-phrase is disallowed from supplying one of them, then some other strategy, such as SOME must be employed instead. Looking back at (87), something like SOME must be fairly freely available for covert degree arguments in comparatives in general, given that *more* can appear with any combination of overt or covert arguments. The question only arises as to why the degree argument typically given by the standard phrase is necessarily covert with additive adjectives, as was shown in (88). To look at what the degree addition reading of something like *I ran additional miles*, two covert degree arguments would be needed. This is the resulting tree below in (89).

(89) I ran **additional miles**.

```
                    VP
                   ⟨v,t⟩
              ╱            ╲
           V                  DP
         ⟨v,t⟩              ⟨v,t⟩
          run          ╱            ╲
                      D                  AdjP
                      ∅                 ⟨v,t⟩
                                    ╱          ╲
                                 Adj′              MP
                              ⟨d,⟨v,t⟩⟩             d
                            ╱        ╲          SOME miles
                          Adj          d
                     ⟨d,⟨d,⟨v,t⟩⟩⟩   SOME
                       additional
```

50

One final thing I should mention about the trees in this section is that I have not discussed arguments about whether the MP or SOME should apply first, especially as both are optionally covert, but in the analysis I gave I assume they apply in the same order that they do for *more*. To get the event summing reading from *more*, the measure phrase must apply after the E-SUM morpheme merges in order for E-SUM to be able to reference the degree E-SUM provides. And following that, the *than* phrase must also apply before the measure phrase because either the *than* phrase or E-SUM may come after *more*, but not both. I extend the same order to the analysis of additive adjectives, but I have no constituency tests in addition to this reasoning to support this order of attachment.

2.5   Consequences of this analysis, and open questions

In this chapter, I improved upon existing analyses of event-summing *more* by compositionally accounting for its homophony with degree addition. This provided an argument for generalizing all cases of the comparative morpheme to a differential one involving explicit addition. The amount of expressions that participate in this homophony also provide evidence that there is a compositional relationship possible between morphemes with degree addition and event summing. In support of this point, I also extended the analysis of this ambiguity to additive adjectives.

One thing worth noting is that if we directly extend the analysis for *more* to additive adjectives, this makes a very odd type for adjectives, which are otherwise $\langle v, t \rangle$ in Wellwood's framework as used here. As per the previous arguments, though, we do want to assume that some of them are syntactically adjectives regardless, even if some of the additive expressions are clearly more syntactically complex. Therefore we must assume that they are simply adjectives with unusual semantic types. Given that they also have unusual effects (for adjectives) and a distribution restricted contexts with degree addition or event summing, having an unusual type does not necessarily seem problematic. Additionally, if precisely the same semantics is extended from *more* to *additional*, then the fact that the two words aren't fully interchangable needs to come from something besides the semantic type. As the semantics of the two are identical, it must be the job of the syntax to block them being fully interchangeable, presumably as the result of *more* being a Deg head and

additional being an Adj.

Another issue this brings up is what the adapted SOME from Schwarzchild & Wilkinson (2002) will need to consist of. Their choice of calling it SOME is not at random, but rather their denotation is partially modeled after the quantifier *some*. But do we want SOME to just refer to some positive nonzero degree, or do we want it to anaphorically reference something in particular? This SOME would need to reference a contextually relevant degree in some cases, although not all. To make this distinction clear, consider (90) and (91).

(90)   Kaylin ran three miles. But I ran more than she did.   (∃ *d. d+3 miles ran*)

(91)   Kaylin ran three miles. But I ran two more (than she did).   (*2+3 miles ran*)

In the case of (90), there is no particular amount more than Kaylin that I ran, so we want the covert argument to contribute the quantificational 'by some amount' reading. In contrast, in (91), it's understood that the second sentence means that I ran two miles plus the number that Kaylin ran. So in that case, the covert degree argument in SOME must be able to anaphorically reference the contextually relevant degree brought up in the previous sentence.

Perhaps one way to think about this optionally contextually relevant degree is underspecification. In the event that there is an available degree in the context given, it is used. In the event there is not, then the idea of "some positive nonzero" degree is the result. This might not be strictly enough defined, as this loose definition leaves no space to explain what happens in sentences like (92), which would have two SOMEs.

(92)   Yesterday I ran two miles. Today I ran additional miles.

(*ran 2+d, where d is not necessarily 2*)

In the case of these two SOMEs, one should anaphorically reference the contextually relevant "two miles" degree from the previous sentence, and the other shouldn't, as this sentence is acceptable in the event that I ran four miles, but it doesn't necessarily mean that in its degree addition interpretation. So if we go with the underspecification route, we now need to specify that SOME refers to the available degree in the given context *only* if it hasn't already been picked up by another

SOME. This seems a little involved for a specification within the denotation for one morpheme, and there are not other rules that prevent something in the context from being referenced more than once. Rather, things in the context are frequently referenced multiple times as conversation continues on the same topic, if not even in the same sentence.

One other possibility is that there are two distinct silent degree arguments: a referential SOME and a quantificational SOME. But how do you then make sure you get the right one in any case? This question parallels asking if there's only one SOME type morpheme, then how do we determine if it's going to be referential in any particular context, and how do we ensure that only one instance is referential in instances like (92) for example? This opens up an interesting question about basic comparatives as they appear without overt degree arguments.

In the scope of this dissertation what is the importance of this data and this analysis? As we want to analyze these as adjectives, this informs us that the additive ambiguity is not a characteristic of Degree heads, and therefore it must result from some aspect of these morphemes' denotations instead. This indicates that an analysis for the more complex phrases should be able to be constructed following the same lines. This concludes the chapter on degree addition and event summing however, as stepping through an analysis of any of the more complicated additive expressions promises to add syntactic complexity without also promising to add further semantic discoveries. The compositional analysis I have presented makes the prediction that if this relationship between degrees and events is regular, we can assume that any construction that allows degree addition (unless syntactically blocked) can be built into an event construction too. The reverse direction is not predicted to be necessarily true; an event construction *may* be able to also denote a degree construction, but it is not the case that all event constructions *will* be able to denote a degree construction. Finally, this cross-categorical analysis indicates that the degree-event relationship is firmly semantic rather than syntactic, as data showing an ambiguity *only* at Deg heads would have allowed for a syntactic explanation.

One final open question from this section involves some of the messier data. I am confident that the analysis for *more* and additive adjectives could be extended to the syntactically complex

phrases. However, some of those phrases are happy to double up with other additive expressions, which is not predicted by my analysis.

(93)   I ran two miles more in addition to what I did yesterday.

(94)   ? I ran two extra additional miles.

The example in (93) seems fairly natural, but it has both *more* and a syntactically complex additive expression. Given that they do the same thing, we should expect a type clash, or minimally redundancy. Instead it seem acceptable, and with the same meaning that either one of the included additive expressions should deliver. Two additive expressions do not always mix well, as (94) shows, where two additive adjectives together do create redundancy, even if it is not outright ungrammatical. My analysis at this point cannot account for this data.

In the next chapter, *more* and *addition* reappear in a different sort of addition, one that appears to be discourse-sized. In addition, further data will call for a detour to discuss focus, and focus sensitivity, in a change of pace from this chapter.

CHAPTER 3

DISCOURSE ADDITION

3.1   Addition on a larger scale

This chapter's data is potentially related to the previous types of addition that we've walked through, given the reappearance of multiple morphemes from the previous chapter. It appears initially similar to event summing in that it could be pretheoretically characterized as adding events to a list of events, but I argue it is distinct from the phenomenon analyzed in the previous chapter. Discourse addition also appears with several different words and phrases, several of which hint toward a morphological link to degree addition and event summing, but one of the easiest places to begin looking at it is with the focus sensitive particle *also*. I will first walk through the data with *also* to make it clear that something is going on, and then add data showing that it is a reading available with several words and phrases, including the ones that suggest a morphological link with other types of addition explored earlier in this dissertation. To make this discourse use of *also* clear, I will first review the "typical", non-discourse addition focus-sensitive use of *also* so the differences of the discourse addition use will be clearly distinct. The following data in (1) provides the baseline of the "typical", non-discourse addition use of *also*, where prosodic focus is indicated by **bolding**.

(1)   Context: A shipment of office supplies has come in, and someone is checking the package against the shipping order. They say:

   a.   We also ordered **pens**.

   b.   # We also **ordered** pens.

In the two options in (1), changing which word is prosodically stressed also changes whether or not this response is felicitous in the given context. This is what makes *also* a focus sensitive particle (FSP). In the case of (1a), this has the presupposition that they ordered something else in addition to pens, which is fulfilled by the given context. In the case of (1b), this has a different

presupposition, one that the given context doesn't fulfill. The sentence in (1b) presupposes that they did something else with pens, maybe stocked them or sold them for example, in addition to ordering them. This is the "typical" FSP use of *also* which is well covered in the literature and often presented as a quintessential FSP. The usual analysis is that *also* asserts p and presupposes the truth of another proposition q (the specifics of which are determined by the focus mechanism, which we'll return to in more detail later). Now that we have a clear sketch of this use of *also*, we can contrast it with the discourse addition use of *also* that I am investigating. That use appears as in (2).

(2) I did a lot of things last weekend! I hung out with friends... I went for a walk...
     <u>Also, I baked cookies!</u>

In the underlined sentence in (2), there is no presupposition that I baked anything else, nor does there seem to be any presupposition about cookies or baking in general. Looking at the underlined sentence, there is no clear presupposition about any related event at all. In a second major distinction from the first use of *also* reviewed, it is not clear that changing the prosodic stress in that sentence would change any contribution of the underlined assertion. Without a clear presupposition, it is unclear what we would expect to change even. Instead, this *also* seems to contribute something else to the effect of the proposition in the discourse, impressionistically signaling the continuation of a list, and not otherwise affecting the asserted content of the sentence. In addition to *also*, several other words and phrases have this effect, which is where the morphological relation to degree addition and event summing appears. The following data shows some of the range of expressions with discourse addition capability.

(3) I did a lot of things last weekend! I hung out with friends... I went for a walk...

a. $\left\{\begin{array}{l} \text{Also} \\ \text{Additionally} \\ \text{In addition} \\ \text{Furthermore} \\ \text{Moreover} \\ \text{What's more} \\ \text{To top it off} \end{array}\right\}$, I baked cookies!

b. I baked cookies $\left\{\begin{array}{l} \text{also} \\ \text{as well} \\ \text{in addition} \\ \text{too} \\ \text{to top it off} \end{array}\right\}$!

All of the above expressions share the same contribution where they pretheoretically seem to signal that a list is being continued. In (3a) and (3b), we see the reappearance of *addition(ally)* and *more*, which we talked about extensively in Chapter 2. Both appear in a few different syntactically varied ways, as well. They are not appearing with measure phrases or with any immediately apparent degrees, but rather they are appearing as sentential modifiers, so some differences are predicted. It's not immediately clear whether we expect this to be a compositional relationship between these uses of *addition(ally)* and *more* and the previously discussed ones. The reappearance of *more* in something like *moreover* is syntactically simple enough that a compositional relationship may be possible, but the variety of structures appearing and the appearance of a more complicated structure involving a WH-phrase in *what's more* signals that a compositional relationship could be much more complicated. We also see the syntactically complex phrase *to top it off*, which parallels the additive phrase *on top of*. There are clear syntactic differences between the two, if not semantic differences as well, but again this parallel signals a morphological link between degree addition, event summing, and discourse addition. However, due to the variety of structures available, the complexity of some of them, and the established foundation of research on FSPs like *also*, I intend

to begin this analysis from the starting point of *also* instead of with the *more* and *addition* data that links with the previous chapter.

It's also worth noting that some of the options in (3a) and (3b) are dialectal, or not accepted in all dialects of English. At a minimum, *too* is perfect here in my dialect but not in others', and some speakers have reported a greater preference for a pause before some of these expressions whereas others are fine without a pause. I will not account for variation or gradient judgments here, but rather I will take the presence of several words and phrases patterning the same again as evidence that some strategy is going on to allow for discourse addition.

It would be easy to simply propose a new denotation for discourse *also* to account for this, different from the regular proposed FSP denotations, and suggest that it is just a lucky homophony and focus is unrelated. However, in addition to *also*, *too* is also a prototypical FSP which also has a discourse addition reading in some dialect, and it seems likely that *as well* or *in addition* could show focus sensitivity in a similar way. Consider the following data testing for focus sensitivity with *as well*.

(4)   Context: A shipment of office supplies has come in, and A is checking the package against the shipping order.

   a.   A: We ordered **pens** as well.

   b.   # A: We **ordered** pens as well.

The data in (4) is identical to the previous example showing the focus sensitivity of *also*, except with *also* replaced with *as well*. As (4) shows, changing which constituent is focused in a sentence with *as well* has the same effect as with a sentence with *also*, in changing whether the sentence is felicitous. It is not just *also* and *too* that have a focus sensitive use, but rather some other phrases that do discourse addition seem to be focus sensitive as well. This is a point that I will return to later in this chapter in greater detail, but for the moment, it seems reasonable to establish an idea of how focus works before working on an analysis for the discourse reading. Whether or not focus is actually relevant to an analysis of discourse addition, I argue that the existence of multiple FSPs

that enable discourse addition is an argument that this is the right direction for the analysis, and that this is not just a lucky homophony.

In addition to that argument for focus being relevant to discourse addition as a whole, I will argue that proposing a denotation for *also* that is simply different from the ones that rely on focus is the wrong move for another reason. Specifically, I will provide evidence indicating that default/typical cases of *also* as an FSP are actually subject to the same restrictions that discourse *also* is subject to. This point will be clearer once I have fleshed out what the restrictions for discourse *also* are, but once the restrictions that discourse *also* is subject to are fleshed out, I will be able to argue for a slightly different denotation for *also*, incorporating these restrictions and using discourse *also* as a tool to discover this nuance of *also* as a whole.

In this chapter I first will walk through some further data to guide an analysis of discourse *also*, then in Section 3.3 I will review the relevant background that I will be assuming and tools that I will be using from models of focus and models of discourse structure. Once we have those tools on the table, in Section 3.4 I lay out the framework for my analysis of how *also* creates its discourse addition reading, before walking through the details of it in Section 3.4.1, and extending it back to analyses of the usual FSP use of *also*. The next step, in Section 3.4.2, is to extend this analysis to other expressions with discourse addition capability. At this point, my analysis for discourse addition will be established, and I can begin talking about whether the predictions it makes are held up. This takes the shape of an analysis of the phenomenon of concessive *only*, in Section 3.5. Finally, Section 3.6 wraps up the chapter with what interim conclusions I can make at this time.

3.2   Further data

The previous chapter built an analysis around data starting with *more*, and while *more* itself cannot appear in this position, some variations on *more* do appear. As a result, I want to give some data showing that discourse addition is distinct from the event summing phenomenon exhibited by *more* in the previous chapter. Although they appear similarly, the two cannot be freely substituted for each other in the same contexts.

(5)   I had a lot of fun this weekend. I hung out with friends, I went for a walk, and
      also I baked cookies!

(6)   a.   * I had a lot of fun this weekend. I hung out with friends, I went for a walk, and
               more I baked cookies!

      b.   * I had a lot of fun this weekend. I hung out with friends, I went for a walk, and
               I baked cookies more!

In (5) I give an example of discourse addition with *also*, and in (6) I show that directly substituting *more* for *also* is ungrammatical. It would be reasonable to hypothesize that *more* is only grammatical in this position if it is morphologically tweaked to something like *furthermore* simply because it's in a different syntactic position, in which case you could hypothesize that this is further event-summing, not a distinct type of addition. This argument seems reasonable because both event summing and discourse addition combine or link events across sentences in some way. However, I argue that discourse addition is distinct from the event summing that *more* does. In this particular case above, there is no clearly summable super-event. Recall from Chapter 2 that event summing was only possible when the subevents mapped to the part-whole structure of the super event, meaning that they were monotonic as defined by Schwarzschild (2002). For example, *I ran two miles, and you ran three more* can be summed to a five-mile running event because the overall event can be broken down by mile-running events. *Baking cookies* cannot be summed with *hanging out with friends* and *going for a walk*. They are different kinds of events. Perhaps we could argue that there is an overarching fun-having event in (5), but in that case, the sub-event of baking cookies would not be monotonic on the fun-having event. The fun-having event could not be broken down into smaller events of baking cookies, but rather it would have to be broken down into smaller events of fun-having. This example situation is therefore incompatible with event-summing, which prompts me to label it discourse addition instead. The reader might recall that we can use *more* to sum events that *seem* to be distinct kinds of events, but only with the context that we use a superevent to group them as the same kind of event. This is in cases like the following example.

(7)   I read a lot of things this week. I read three books on Monday, and <u>I read two more papers on Tuesday</u>.

In (7), book-reading events and paper-reading events appear to be initially distinct, but the context explicitly groups them both as types of thing-reading events via the first sentence saying *I read a lot of things*, so event-summing *more* is acceptable. Therefore *more* can be used to sum events that initially appear to be different kinds, but only if context can be managed to group them as the same kind of event so they can still be interpreted as monotonic on the superevent. In this case, three book-readings and two paper-readings add up to five thing-readings. While the new type of addition is shown in (5) still could be characterized as adding some kind of sub-events together for an overarching fun-having event, the lack of a monotonicity requirement on those sub-events is how it patterns differently from event summing. I treat discourse addition as distinct from event summing on the basis of this lack of a monotonicity requirement. As per the label I have given "discourse addition", the direction I am going to pursue with this analysis is discourse-oriented instead of continuing to focus on sub-events.

I have characterized the impact of these discourse addition expressions as signaling the continuation of a list. Correspondingly, to look at where discourse addition is disallowed, *also* and the other phrases that do this are infelicitious out of the blue, without supporting context or when changing the topic.[1]

(8)   a.   # ...and that's why I think Gritty is the hero we deserve. To totally change the topic, also I broke my deadlifting record!

       b.   # ...and that's why I think Gritty is the hero we deserve. To totally change the topic, I broke my deadlifting record in addition!

---

[1] There was much discussion at my defense about the felicity of an out of the blue *also, you're an idiot* or *also, fuck you*. For starters, I suggest that a totally out of the blue occurrence where someone enters a room and says either of those things to someone already there is not actually totally felicitous. They do seem to be acceptable in changing topics, but in those cases some list of 'things that are insulting the listener' or something similar may be being compiled across the discourse. At this time, I am not going to speculate further about insults or swearing, but rather I will stick to simpler examples.

In (8a), *also* is definitely infelicitous with a topic change, or out of the blue, and in (8b) replacing *also* with *in addition* is equally unacceptable. There is a kind of way where *also* can be used seemingly out of the blue, but I will analyze that case as not actually out of the blue. In these places it is contributing to an overarching discourse topic, and it still must follow the supporting context, even if not *immediately* follow it. Consider the following example with considerably more supporting context.

(9) **Context:** Alex and Brady are chatting with the explicit goal of catching up after some time apart. Alex has told Brady about their studies, about recent books they've read, and about their recent Pokemon Go addiction. While Brady is still responding to the Pokemon Go topic, Alex can interrupt:

Alex: Oh, also I broke my deadlifting record!

This example in (9) clearly interrupts one topic with an overt topic change, but here *also* is definitely felicitous. However, the supporting context involves a conversational goal of Alex reporting to Brady all of the things they've done recently. As a result, a much shortened version of this conversation could look like the *I had fun this weekend* example if it were lacking the intervening responses from Brady and discussion. This point of the supporting context is so that this conversation can be analyzed as working toward Alex and Brady informing each other about their recent life events, or as answering the overarching question of something like "how have Alex and Brady's lives been recently?". As a result the use in (9) is not out of the blue, but rather, simply refers back to an overarching topic instead of the immediate one. It still appears in a list environment, but the list of answers to this question is more widely spaced over the discourse in this kind of example. The presupposition contributed by discourse *also* must be relevant to its use in the discourse, resulting in this list effect by flagging how to consider p with respect to the conversational topic, question, or related theoretical discourse structure. I am leaving this open until we have stepped through some analysis of discourse structure and of the phenomenon itself, but I will discuss this further later.

Finally, discourse *also* is not limited to appearing only in assertions, but rather it can appear with other illocutionary forces, as shown below.

(10) I know you had a lot of fun last weekend, hanging with friends and going on walks. Also, did you bake cookies?

(11) Have fun at the party tomorrow! Also, don't forget to bring the brownies you made.

In (10), discourse *also* appears in a question, and in in (11), it appears in an imperative. As like its appearances in assertions, the question version of discourse *also* does not require that anyone have danced with anything other than cats. The imperative version also does not require that the listener refrain from forgetting anything else. What this means for the analysis is that discourse *also* requires a denotation compatible with multiple types of illocutionary force.

In the next section, I will step away from the discourse addition data momentarily, in order to review the tools that I expect to need in my analysis. In this case, I will be reviewing Rooth's model of focus and pieces of the Farkas & Bruce (2010) and the Roberts (2004, 2018) models of the discourse structure, in order to focus on discourse *also* to start.

3.3 Framework and required tools

There are two main chunks of theoretical background or tools that I need for this chapter's analysis. In order to work with a theory of focus sensitivity, I will first introduce Rooth's model of focus. Then, given that I have already previewed how discourse *also* signals the continuation of a list through the discourse, I will discuss some existing models of discourse. Specifically, in this chapter I will be working in the Table model from Farkas & Bruce (2010), but I will also reference pieces of or notions from the Conversational Scoreboard model discussed by Roberts (2004, 2018).

3.3.1 Rooth's model of focus

The background of focus semantics is much larger than this quick section suggests, even if we stick only to alternative semantics as Rooth worked on in his 1985 dissertation and further work. Focus

appears in analyses of many things, not just when analyzing adverbs that interact with focus. Rooth (1992, 1996) steps through an analysis of contrastive focus, and the role that focus plays in whether an answer (with focus) is a licit response to a question, at least, so focus has effects on the truth conditions and felicity of a sentence even without an overt FSP. Consider the following examples from Rooth (1996).

(12) **Officers** must escort ballerinas.

(13) Officers must escort **ballerinas**.

Imagine a context where a bank clerk escorts a ballerina. This violates the rule in (12), but not in (13), even though the two sentences differ only in where the prosodic stress is placed. In contrast, a situation in which an officer escorts a journalist violates (13) but not (12). Thus changing where the prosodic focus is in a sentence does have an effect all by itself.

I will review how focus works specifically with regards to when it interacts with an FSP, rather than reviewing the whole history of focus research and how it patterns in various situations. A proposition with a FSP is not quite the minimal working example, but I feel that including something like *only* can make the role of focus clearer, and more importantly this is the focus interaction that we care about here. Prosodic focus interacting with a FSP works as briefly modeled earlier with *also*, where the prosodically focused item in the sentence affects the meaning when it interacts with a focus sensitive particle. It does this through the generation of a set of alternatives, the shape of which depends on which element in the sentence is stressed. For example, consider the following minimal pair. We know that *also* presupposes another proposition is true every time it appears, but depending on where the focus is in the following sentences, a different set of propositions is generated from which that presupposition can be satisfied.

(14)   **Erica** also baked cookies.
$$\left\{ \begin{array}{l} \text{Erica baked cookies} \\ \text{Kaylin baked cookies} \\ \text{I baked cookies} \\ \text{Kevin baked cookies} \\ ... \end{array} \right\}$$

(15)   Erica also **baked** cookies.
$$\left\{ \begin{array}{l} \text{Erica baked cookies} \\ \text{Erica ate cookies} \\ \text{Erica purchased cookies} \\ \text{Erica sold cookies} \\ ... \end{array} \right\}$$

(16)   Erica also baked **cookies**.
$$\left\{ \begin{array}{l} \text{Erica baked cookies} \\ \text{Erica baked muffins} \\ \text{Erica baked brownies} \\ \text{Erica baked scones} \\ ... \end{array} \right\}$$

In the case of (14), *Erica* is stressed, and correspondingly the presupposition is that some proposition of the form *x baked cookies* is true, such as appear in the example set given. In (15), the propositions (and the presupposition) are instead of the form *Erica V'ed cookies*, as the verb *baked* is stressed. Finally, if we stress *cookies*, we get yet a third option, where the presupposition is that some proposition such as the ones in the example set given is true, something of the form *Erica bakes x*. In all of these cases, the asserted content is the same, but the presupposition ends up different because a different set of alternatives is generated. So the important question is how is this set generated formally.

Multiple theories for how this set is generated compositionally exist, and for simplicity, here I will review what has been proposed by Rooth, whose model I am working in. Rooth works with a two-dimensional theory of alternative semantics. Any constituent is represented in one dimension as simply the ordinary value of the that expression, which we can write as $[\![\alpha]\!]^o$ for the ordinary

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semantic value. The same constituent is simultaneously represented in a second dimension with its focus semantic value, which we can write as $[\![\alpha]\!]^f$. The focus semantic value contains minimally the same thing as the ordinary semantic value, but if alternatives are generated, they are represented in the focus semantic value and not the ordinary semantic value. As for how those alternatives are generated by prosodic focus, here is what Rooth (1996) proposes on pg. 10 for a rule of focus interpretation and generating alternatives recursively:

(17)   a.   The focus semantic value of a focused phrase of semantic type τ is the set of possible denotations of type τ.

b.   The focus semantic value of a non-focused lexical item is the unit set of its ordinary semantic value.

c.   Let α be a non-focused complex phrase with component phrases $\alpha_1, ..., \alpha_k$, and let ϕ be the semantic rule for α, e.g. function application. The focus semantic value of α is the set of things obtainable as $\phi(x_1, ..., x_k)$, where $x_1 \in [\![\alpha_1]\!]^f \wedge ... \wedge x_k \in [\![\alpha_k]\!]^f$.

What this means, is that everything has an ordinary semantic value $[\![\alpha]\!]^o$ and a focus semantic value $[\![\alpha]\!]^f$, but if there is no focus causing a set of alternatives to be generated, then $[\![\alpha]\!]^f$ is the singleton set containing just $[\![\alpha]\!]^o$. However, the focus semantic value of constituents higher up the tree is recursively generated, so once focus generates a non-unary set of alternatives *somewhere* in a tree, all greater constituents will also have a non-unary set focus semantic value. This recursive generation of further focus semantic values is done via pointwise function application (or whatever other rule is applying at that node if a rule other than function application is applying). This allows a set of alternatives generated at a small constituent to end up creating a set of alternatives for the sentence as a whole, in the form of being the same as the original proposition except for the focused constituent. To make this clearer, I am including Rooth's step by step example, giving what the focus sets of *John introduced **Bill** to Sue* looks like. (Note that the formalization here is as Rooth wrote it, rather than matching the rest of the dissertation, and that focus is correspondingly marked with a subscript instead of bolding.)
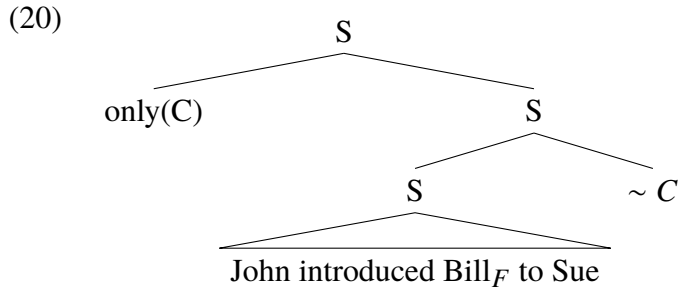
(18) $[\![\text{Bill}_F]\!]^{\text{f}} = E$, the set of individuals

$[\![\text{John}]\!]^{\text{f}} = \{j\}$, the unit set $[\![\text{John}]\!]^{\text{o}}$

$[\![\text{Sue}]\!]^{\text{f}} = \{s\}$, the unit set of $[\![\text{Sue}]\!]^{\text{o}}$

$[\![\text{introduced}]\!]^{\text{f}} = \{\textbf{introduce}\}$, the unit set of $[\![\text{introduces}]\!]^{\text{o}}$

$[\![[_{\text{VP}}\text{introduced Bill}_F \text{ to Sue}]]\!]^{\text{f}} = \{\lambda x \textbf{introduce}(x, y, \textbf{s})|y \in E\}$, the set of properties of the form 'introducing y to Sue'

$[\![[_{\text{S}}\text{John introduced Bill}_F \text{ to Sue}]]\!]^{\text{f}} = \{\textbf{introduce}(\textbf{j}, y, s)|y \in E\}$, the set of propositions of the form 'John introducing y to Sue'

In this way, focusing a small constituent produces not just alternatives at that level, but also a whole set of alternative propositions. At that point, FSPs can then interact with both the ordinary semantic value and the focus semantic value both. So for example, *also* would assert that $[\![\text{p}]\!]^{\text{o}}$ is true, and it would presuppose that one of the propositions generated in $[\![\text{p}]\!]^{\text{f}}$ as above is also true. However, the focus semantic value is drastically unrestricted. In the example above, the number of propositions it contains should equal the number of members in the set of individuals. In order to restrict this to something manageable, Rooth proposed that the constituent that is prosodically stressed interacts with a covert focus-interpretation operator, written as ~, which interacts with a covert free variable C, which is a subset of the focus semantic value $[\![\alpha]\!]^{\text{f}}$. This restricted set C is then what the FSP interacts with in Rooth's theory. Rooth (1996) defines C as a free variable, where focus gives information about C, but also its form can be further restricted pragmatically. Effectively, it is a contextually restricted subset of the set of alternatives generated by ~ . Here in (19) is how Rooth (1992) defines C.

(19)   Where ϕ is a syntactic phrase and C is a syntactically covert semantic variable, $\phi \sim C$ introduces the presupposition that C is a subset of $[\![\phi]\!]^{\text{f}}$ containing $[\![\phi]\!]^{\text{o}}$ and at least one other element.

The focus interpretation operator ~ effectively interfaces between the focus semantic value and whatever requires access to alternatives, such as the FSP. Once a set of alternatives in a focus

semantic value is generated, a subset C can be obtained via ~, and then FSPs are free to interact with it. In order to make this slightly more explicit, let's continue to walk through some of Rooth's example from the 1996 paper. Below I give their denotation for *only* and the syntax (which I have translated from brackets to a tree) they assume for *John only introduced **Bill** to Sue*.

(20)

```
                    S
           ╱                ╲
      only(C)                S
                       ╱          ╲
                      S            ~ C
                 ╱        ╲
          John introduced Bill_F to Sue
```

(21) $[\![\text{only}]\!] = \lambda C \lambda p \forall q [q \in C \wedge \check{} p \leftrightarrow q = p]$

What this denotation does is assume that the FSP *only* interacts first with the covert free variable C, which represents a subset of $[\![\phi]\!]^{\text{f}}$. A non-singleton set of alternates is generated at *Bill*, and then every constituent higher up the tree also has a non-zero set of alternatives as generated in (18). *Only* then applies at the level of the proposition p, and it asserts that for all propositions q in C, if q is p (which is possible because $[\![\phi]\!]^{\text{o}} \in [\![\phi]\!]^{\text{f}}$), then p is true.

Before I move on, I want to address the questions that this C raises. One question I take away from this analysis is where is C located syntactically? It seems to be the case that it is located wherever is convenient for the FSP to apply, rather than being located somewhere syntactically specific. Given that every constituent should have a focus semantic value available, it might make better sense to say that *only* simply interacts with that, and the context is used in some way to restrict the focus semantic value. Some people do work on focus without a C variable, and instead just reference the focus semantic value or alternative set of a constituent. For example, work on focus by Erlewine (2014) uses the following denotation.

(22) $[\![\text{only } \alpha]\!] = 1$ iff $\forall q \in [\![\alpha]\!]^{\text{f}}[q \neq [\![\alpha]\!]^{\text{o}} \to q = 0]$

In (22), we see the focus semantic value referenced instead of C. Context will necessarily still play some role in restricting the focus semantic value, but this leaves it open as to how that

restriction is done. This is less restrictive than a theory requiring a *C*, but it does not need us to predict when or where *C* occurs, or assume it appears simply wherever a FSP requires one. A second important question is brought up the moment we talk about "context" restricting something: what is "context", or formally speaking how is something "contextually restricted"? As Rooth's *C* is contextually restricted, this matters in Rooth's theory as much as it does in a version where the focus semantic value is contextually restricted when it is used. I will go into this further when I flesh out an analysis, but for the moment it is worth flagging this issue of the theory not making precise predictions. Is the context the discourse? If so, what structure are we assuming? Do we want more elements than a Common Ground (CG), and if so, what do we need to include, and are they all included in "context" or just some of them? For the moment I will just leave these questions raised, but my goal is to formalize how to use the the discourse to contextually restrict *C* or the focus semantic value.

For completeness, it is worth mentioning that in terms of other theories of focus, another main track people follow is the movement theory of focus, where focus effects result from structure where focused phrases scope higher (Chomsky, 1976; Von Stechow, 1982; von Stechow, 1985). This theory is particularly useful for dealing with some issues like weak crossover effects with focus, but, none of the issues that a movement theory of focus is specifically designed to deal with are relevant to the data I discuss in this dissertation, so as a result, since it has no bearing on my data here, I find it convenient to stick to the analysis with fewer moving parts.

3.3.2 Discourse frameworks and context

In order to capture this idea of "a list across the discourse", where discourse *also* needs to follow some related propositions, we need a model of the discourse. Where can the items of this list be drawn from? An articulated model of the discourse that separates out distinct categories for propositions, ones that interlocutors track, allows for precise predictions about what we're referring to when we refer to "propositions in the discourse". An important question that I will be asking in this chapter is what does "context" mean, given that in the model of focus that I just overviewed, *C*

is contextually restricted. I ask this question specifically with regards to the phenomenon of focus sensitivity, but I do not doubt that my conclusions here will provide a new angle for discussing context in analyses of other semantic phenomena.

The idea of a Common Ground (CG) is uncontroversial, containing the propositions that speaker assumes are shared knowledge (Stalnaker, 1978, 1996). Some world knowledge is assumed, but minimally, things that the discourse participants have all agreed to would be entered into the CG. However, we cannot view the discourse as consisting of just the CG, but rather we minimally need something like individual discourse commitment sets for items that we do not agree on adding to the CG. At this point, our discourse consists of multiple discrete objects that we can refer to, so we must then consider the possibility of each one being able to be a part of what is restricting something when we say "context" is restricting the options, and we need to be precise about our assumptions about the structure of the discourse. Once we have expanded our discourse model to include more than one object, it's worth exploring what else might be available.

Here I will be following Farkas & Bruce (2010) in their Table model of discourse. In addition to assuming the existence of the CG as a set of propositions, they add a few more categories to their model. If two interlocutors disagree about a proposition, it cannot be added to the CG, but if they agree to disagree, then p is added to the Discourse Commitments (DC) of the interlocutor that committed to it, and not to the DC of the interlocutor that did not commit to it. Any interlocutor's DC is also a set of propositions. Anything that is proposed to enter the CG but not yet confirmed or denied is on the Table. This is similar to the idea of a Question Under Discussion, and in fact a question would go there, not just a proposition. The Table is a set of propositions, as a question is a set of its answers (Hamblin, 1973; Karttunen, 1977), and it functions as a stack. This captures how an overarching QUD can stay on the Table, as sub-questions get added to the top of the stack, dealt with, and then removed, all without needing to remove or change the overarching QUD. I will return to the idea of a QUD in a minute when I discuss Roberts' work. And finally, the Projected Set (PS) is the set of expected CGs after whatever is on the top of the Table stack is resolved. Note that the other categories so far have been sets of propositions, but the PS is a set of sets of propositions

instead. This is what I am assuming for the discrete objects in the discourse that interlocutors enter propositions into. However, I also want to briefly discuss another model of discourse structure.

Roberts (2018) and previous work discuss a fleshed out scoreboard for a language game in their strategy of determining whether conversational moves are relevant. Most of the pieces of her framework will not be relevant here, so I will only walk through the elements that I will be using. The piece of this scoreboard that I would like to bring up specifically is the part where interlocutors must track a set of goals and priorities held by the participants in any given conversation. Roberts separates "domain goals" from "discourse goals". Domain goals are the things that the interlocutors are publicly committed to doing in the real world (and the strategies they use in order to achieve these goals), so they are effectively the real world goals that interlocutors have. This is both the intuition and the object in the discourse that I will be referencing. Discourse goals, as she defines them, are the subset of domain goals that are to be achieved within the discourse itself, such as answer questions. This distinction is not one that I will be using here, and furthermore, Roberts equates these to effectively QUDs, which I will be referencing as questions specifically. As a result, I will not be using this notion of discourse goals, just domain goals, so for convenience I will usually refer to "goals". QUDs may arise indirectly from overt goals, but I will treat explicit questions here as going on the Table (Farkas & Bruce, 2010), and I will model them as the set of their answers (Hamblin, 1973; Karttunen, 1977), rather than as a goal. They may *also* appear in the category of goals that interlocutors track in some way, but I will not be dealing with that. The intuition from goals that I will be using in this analysis is that they guide the discourse and indirectly constrain what moves are licit in the given conversation. Roberts uses a notion of Relevance here, which I will review as well. Consider the following example, originally contributed by Asher & Lascarides (1998), and discussed with regards to goals by Roberts (2004). I have added the names to the original example for clarity.

(23)   Alex: I need to catch the 1:20 to Philadelphia. Where's it leaving from?

Brady: Platform 7.

Alex: Where do I get a ticket?

Brady: From the booth at the far right end of the hall.

Roberts (2004) identifies the first sentence in (23) as establishing a goal for Alex and, since Brady does not object, adding it to the set of domain goals for the interlocutors. The goal guides the following conversation in that all the following questions must be Relevant to this goal. Roberts specifies that "to be Relevant to the established domain goal, subsequent discourse must attempt to further it, directly or indirectly;", adding that in the case of (23), "this is reflected in the addition to the set of questions under discussion QUD of the question of how to catch the train." So while there is no explicit QUD overarchingly about how Alex can catch the train to Philadelphia as a whole, the following questions make it clear that cooperative discourse is now currently dedicated to enabling that goal, and following QUDs are about how to realize it. An unrelated question would not be a relevant discourse move, and therefore this goal serves to guide the discourse. The notion of "relevance" is unfortunately widely useful and needed, so here I copy the definition for the term itself that she settles on in her 2018 paper. I first give an explicit definition of "address" that she gives on pg. 8, and then the shorter definition for "relevance" that uses it from pg. 10. This is the definition that I will reference later in this chapter.

(24)   An utterance m **addresses a question** q iff m either contextually entails a partial answer to q (m is an assertion) or is a part of a strategy to answer q (m is a question) or suggests an action to the addressee which, if carried out, might help to resolve q (m is a suggestion).

(25)   Given QUD q, a move m is **RELEVANT** iff m addresses q.

The notion of addressing a question is defined in (24), where a move can be an assertion, another question, or an imperative. This is used for a shorter definition of relevance in (25), which I will be working from later for convenience. However, Roberts has already made it clear that a similar use of "relevance" with regards to goals is needed, as assertions can address questions, but questions can address goals similarly. What I will do later in this chapter with this is formalize this distinction by defining Relevance$_g$, or Relevance to a goal g, as opposed to relevance to a QUD q. This will not by itself be quite enough to deal with the data in that section, so I will propose further notions

from there, but this sums up the theoretical material that I will be building upon from Roberts'
work.

To summarize, in this chapter I will be working with focus sensitivity, with the goal of formal-
izing what " discourse context" means. Toward that end, I have articulated what the stucture of the
discourse that I am assuming is. Interlocutors must be tracking more information in the discourse
than simply what propositions have been said, and past propositions must be able to be placed
into more categories than simply the Common Ground. Specifically, I am working with the Table
model of discourse structure from Farkas & Bruce (2010), and incorporating the notions of goals
and relevance from Roberts (2004, 2018) as well.

3.4   An analysis - proposition level focus

Given Rooth's of model of focus, I expect that discourse *also* can be accounted for fairly
easily, and in a way that allows its analysis to be brought back to the "typical" FSP uses of *also*.
Specifically, I propose that discourse *also* is identical to the 'normal' FSP use of *also*. It appears
initially distinct from the uses of *also* that are typically analyzed because it doesn't seem to have
an existing presupposition, and because nothing in the sentence stands out with prosodic focus.
However, the fact that it must occur in a list environment can be analyzed as meaning that there
is some presupposed existing proposition ensuring the existence of the previous item(s) in the list.
The immediate issue that makes this kind of presupposition look different is that those items don't
need to match the structure of the existing proposition in the same way that the 'normal' FSP
also alternatives must. This, I argue, is because the focused constituent in the proposition is the
proposition itself, as a whole, rather than a smaller constituent. Once I have an analysis on the table
for discourse *also* involving focusing the proposition as a whole, I will use it to investigate how to
define "contextual restriction" in the context of how the discourse comes into play when restricting
the focus semantic value of a proposition to C. Next, I will take those conclusions and reapply
them to uses of *also* with smaller constituents focused.

To return to the first step, this analysis involving proposition level focus opens up the question,

or questions, of what would it mean to focus an entire proposition. In terms of prosodic stress, what would this look like? In terms of the semantics, what would this look like? I suggest that in both cases, the result is likely to be uninformative. Prosodic stress is signaled in a few ways, such as pitch, intensity, volume, or duration. However, due to speaker variation and variation of real world conditions like obscuring noise and such, this must be interpreted relative to the rest of the utterance. There is no obvious way for a speaker to pronounce a proposition and make it clear that it's more heavily stressed, when the usual way of making it clear that something is stressed is via proposition-internal cues. So proposition level focus necessarily can't be signaled in the same way that focusing a word or small phrase within a proposition is signaled. So prosodically speaking, focus could be signaled in some other way when it's sentence-level, or if it's signaled the same way, it is likely hard to pick up on. Heim (1992) provides an argument for focusing silent arguments that I repeat here. Consider the following sentence.

(26) John wants to come too.

In (26), this can mean that John wants to come in addition to someone else coming. However, if *John* is the focused element, then *too* attaches to the matrix clause, and the result should then be that John wants to come in addition to someone else *wanting* to come, rather than the intended meaning of John wanting himself and someone else to come *with him*. Therefore, Heim proposed that the following representation in (27), where a silent pronoun bears the focus marking, is needed in order to get the correct semantics.

(27) John wants [PRO$_F$ to come too].

If we accept this representation in (27) and its corresponding argument in favor of our ability to focus silent elements, then stressing a full proposition must be possible even though it is likely phonetically unmarked. As for what it means in terms of its semantics, we must consider how focus generates a set of alternatives. In Rooth's formula, the focus semantic value of a constituent with prosodic focus is the set of possible things of that type, so in this case we should get the set of possible propositions. In other words, there are no restrictions on what the propositions in the

alternative set can be, making this a truly vast set of propositions. When smaller constituents are focused, the focus semantic value of the proposition at the end bears a lot of similarity to the original semantic value, because all but one element will remain the same. But if the whole proposition is focused, then the whole proposition can vary. At a glance, proposition level focus seems wholly uninformative in terms of its semantics, due to this wholly unrestricted set. As a result, the idea of how it is "contextually restricted" would be crucial for determining how this becomes something informative.

Putting this question of mechanics back aside for a moment, it would seem unlikely that multiple FSPs coincidentally all participate in discourse addition even though the focus semantic value is uninformative. This indicates that maybe whatever focus is contributing is *not* as uninformative as it appears. Two elements are relevant to my analytical direction here. First, *also* and *too* are analyzed as presupposing that another proposition from the set of focus alternatives is true. But if the focus set is wholly unconstrained, then this would be satisfied for discourse *also* because every possible proposition is in the set of alternatives, and that will necessarily contain some true proposition. So this presupposition would be vacuously satisfied in every case rather than it being an informative presupposition by being potentially satisfied but potentially not. The theory is that "context" restricts the focus semantic value from everything of that type to whatever is contextually relevant, which is what Rooth called C, but I would like to propose to make that more precise, in a way that will also make the presupposition for discourse *also* informative. And second, recall that discourse *also* must appear in a list environment to be felicitous, so one way to phrase this formally would be that it must appear after some other relevant proposition has been entered into the Common Ground, or some other relevant category in the discourse. One way of putting these two pieces together is to propose that the set of alternatives that discourse *also* is presupposing the existence/truth some relevant q from is the set of propositions in the CG / relevant discourse category. Toward that end, I propose that discourse *also* is just the regular FSP *also*, where the whole proposition is focused. Thus this analysis will assign the same denotation for both.

However, given that the whole proposition being focused is apparently uninformative before

being contextually restricted, I will analyze the specific use conditions for discourse *also* as resulting from *how* the focus semantic value is contextually restricted. Specifically, in order to get the effect that the felicity of discourse *also* is affected by the shape of the discourse as a whole, I propose that the contextual restriction is being restricted by some object in the discourse structure. This is where the articulated assumptions for what the discourse structure consists of comes into play. As a reminder, I am specifically working to define "context" using discourse structure for dealing with focus sensitivity. I do expect the consequences of my research will aid analyses of other phenomena, but here I am focusing on just the one. In Rooth's formalization, this is the restriction that cuts $[\![\alpha]\!]^{\text{f}}$ down to C. In a theory without an official C, and with just the understanding that context restricts what we consider, this would be a restriction applied directly to the focus semantic value of the proposition. This kind of restriction could be placed in the hands of an overarching principle on focus interpretation, or in the lexical semantics of the morpheme itself, or potentially somewhere else. The conclusion I will arrive at is that this should be lexically specified, but until I present evidence for that, I will simply talk about C as already having this restriction in order to be temporarily agnostic as to what applies it to get C.

In the next section of this chapter I will assume this kind of restriction on C in order to step through an analysis of discourse *also*, before showing that this restriction actually applies to all uses of *also*, indicating that this should be analyzed as a lexical restriction instead of as a sweeping discourse principle. The existence of this kind of lexical restriction would make the prediction that discourse *also* would not be the only FSP that is capable of interacting with focus when it applies at the level of the proposition. Other FSPs could have a similar restriction allowing proposition level focus to be interpretable, although lexical variation means that they would not necessarily all have, or need, a restriction that allows proposition level focus to be interpretable. Therefore next I will pursue this prediction and step through data for concessive *only* as an argument in favor of other FSPs interacting with proposition level focus with the discourse restricting C.

3.4.1 *Also* and proposition level focus

To step through this analysis, my proposal for discourse *also* is that it functions like 'regular' *also*, but the proposition is the focused constituent. So it asserts p, and it presupposes the truth of some q from the focus set of alternatives. Given that discourse *also* only appears in a list environment, I propose that this is because in this case, C is restricted to propositions in the common ground (CG) that relate to some QUD. This has the result that *also* is infelicitous if it is not at least second in a list, because it presupposes that some other q is true, and that q has to be from the common ground, so some related propositions have to already be entered into the CG. This is the first half of the restriction, that all of the elements in C must be in the CG.

Like what would happen with a totally unrestricted C, if all the propositions from the CG were in C, then discourse *also*'s presupposition of q from C also being true would be vacuously fulfilled and still uninformative. So which propositions from the CG should be in C? The restriction must be slightly more informative. This goes back to the idea that discourse *also* flags something about how to consider p with respect to the QUD; there must be some proposition(s) in the CG already in response to this QUD. Discourse *also* is infelicitous in a total topic change or utterly out of the blue. Consider the following example.

(28) Alex: I heard you had fun at the party! What did you do?

Brady: I chatted with friends, I ate cake and <u>also I danced with cats!</u>

QUD: What did Brady do at the party?. C: $\left\{ \begin{array}{l} \text{I danced with cats} \\ \text{I ate cake} \\ \text{I chatted with friends} \end{array} \right\}$

The example in (28) shows a use of discourse *also*, the relevant QUD, and the resulting set of propositions that are both answers to the QUD and in the CG. That set is effectively the C that the focus semantic value of the proposition is restricted to. The *also* presupposition is that some q from C is also true, which is met here because all two of the non-p propositions in C have been asserted. Discourse *also* is then predicted to have presupposition failure if there isn't something relevant in the CG already, which explains why it's infelicitous to use discourse *also* out of the blue or when

totally changing topics. However, this successfully predicts that discourse *also* is felicitous in the context where it 'reaches back' to a previous topic, as in the example repeated here.

(29)   **Context:** Alex and Brady are catching up. Alex has told Brady about their studies, about recent books they've read, and about their recent Pokemon Go addiction. While Brady is responding to the Pokemon Go topic, Alex can interrupt:

Alex: Oh, also I danced with cats this weekend!

In (29), the immediate context is unrelated to Alex's interruption. However, discourse *also* flags that it's not actually unrelated, but rather that it's a part of an answer to an established QUD, and a continuation of an overarching topic. In fact, without the *also*, the interruption comes off as totally out of the blue and much more unrelated than without it, so it appears that *also* is in fact establishing that this proposition is not unrelated by virtue of it presupposing that there are propositions related to the same topic in the CG already.

The use of *also* in (29) indicated that the propositions in *C* can at least include the propositions in the CG. The next logical question is whether it can include propositions from other objects of the discourse instead of just from the CG, which means we must flesh out what model of the discourse we are working with. As a reminder, I am working here with the Table model from Farkas & Bruce (2010) as a starting point, which means there are a few distinct objects that speakers are tracking in their model of the discourse besides simply the CG. The other categories that a proposition can enter include: the Table, where propositions that are proposed to enter the CG go; for any interlocutor X we have the Discourse Commitments of X, which includes the propositions that X has publicly committed to but have been blocked from entering the CG; and the Projected Set, which is a set of expected CGs. The CG, Table, and each interlocutor's DC are all sets of propositions. The PS is a set of sets of propositions. Working with this discourse model allows us to independently test which categories *also* can access, which both clarifies how discourse *also* is working and provides evidence for these discrete objects in the discourse being ones that interlocutors access.

So far we have evidence that *also* can presuppose the truth of propositions in the CG. Next, I show that *also* is not able to presuppose the truth of propositions in either a listener's or the

speaker's DC. In order to tell if *also* can follow propositions in either the listener's or speaker's DC, we need an example discourse where the participants disagree. This is the goal of the following two discourses, where I first set up *also* to follow propositions in the listener's DC, and then the speaker's. I have also underlined the *also* proposition for clarity, due to the length of the discourse needed. In (30) below, this discourse aims to have *also* interact with a proposition in the listener's DC.

(30)   Alex: I heard Jordan had a great time last weekend! They went to a party... They baked cookies...

Brady: They said they were going to do both those things, but they did neither of them. The party was canceled, and they were out of flour to bake.

Alex: No, they did those things!

Brady: Well, on the topic of the great time they had last weekend, <u>also they broke their deadlifting record</u>!

In (30), the propositions that Jordan went to a party and that Jordan baked cookies cannot go in the CG because the discourse participants are not in agreement on them. The interlocutors do not sort this out, but rather they have to agree to disagree. This means that Alex has in their set of discourse commitments both of those propositions, and Brady has negated versions of both instead in theirs. If *also* can presuppose the truth of propositions from the listener's DC, then Brady should be able to felicitously use *also* in this final sentence in (30). However, the most natural reading here seems to be that Brady is being sarcastic or uncooperative or something. Assuming a non-sarcastic and totally cooperative intention, *also* does not seem felicitous here, which would mean that *also* cannot presuppose propositions from the listener's DC. This result is not surprising, because it would be odd for a speaker to presuppose something they just explicitly negated. I tested it on one hand for completeness, and on the other hand with the goal of making my theoretical assumptions explicit. Here I have walked through a test for whether a FSP can interact with propositions in the listener's DC, which can be used in further cases of exploring what role the discourse and the discrete objects within it play in contextual restriction. Between the listener's and speaker's DCs, it

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seems more likely that *also* would be able to presuppose propositions from the speaker's DC than from the listeners, which is what I test next.

(31)   Alex: Jordan had a great time last weekend. They went to a party and they baked cookies!

Brady: They said they were going to do those things, but they did neither of them. The party was canceled, and they were out of flour to bake.

Alex: I think we have to agree to disagree about what Jordan did last weekend.

Brady: We do.

Alex: Anyway, to return to the great time Jordan had last weekend, <u>also they broke their deadlifting record</u>!

In (31), again the propositions that Jordan went to a party and that Jordan baked cookies cannot go in the CG because the discourse participants are not in agreement on them. When they agree to disagree, this again means that Alex has in their set of discourse commitments both of those propositions, and Brady has negated versions of both instead in theirs. If *also* can presuppose propositions from the speaker's DC, then Alex should be able to felicitously use it in this context. However, given that this use in (31) does not seem felicitous, it seems that *also* can *not* presuppose propositions from the speakers DC either.

So far *also* can presuppose the truth of propositions that are in the CG, but it cannot presuppose the truth of propositions that are in either the speaker or listener's DC. Two more discrete objects in the discourse structure to also consider are the Table, the set of propositions under consideration to enter the CG, and the Projected Set (PS), the set of projected upcoming CGs. Both of these objects contain in some way the proposition(s) on the Table, but given that the PS is a set of sets, it is of a different type than the CG, a set of propositions. The Table is also a set of propositions, and thus talking about the Table will be an easier way to formally access propositions that are not yet in the CG or someone's DC than talking about the PS would be. The propositions in the sets in the PS are not *strictly*² a union of the Table and CG, but in simple cases like regular declarative sentences

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²For example, a move could challenge something in the CG to propose changing it. In that case, a union of the CG and the proposition on the Table would result in the empty set, so in this case

and simple questions, that characterization suffices. As a result, and for compositional ease, I will discuss the Table for propositions that have not yet been added to the CG or a speaker's DC, and not the PS. Stalnaker (1978) proposes that if there are no objections from discourse participants, assertions are moved from the Table to the CG, but I do not know how quickly this should happen. If propositions are added too quickly to the CG (even if no one is monologuing), then a slow or belated objection requires downdating the CG to remove a prematurely added proposition, and possibly readding something to the Table. But at the same time, how long is too long to wait to add something? Conversation can move on very quickly, and it can be difficult to judge as an interlocutor when everyone is done with an assertion or with a topic as a whole. Individual variation is likely to make this even harder. Consider the following data showing that *also* can presuppose the truth of propositions that I would argue are not yet entered into the CG. Here, some of the examples I have so far been using might be relevant here if embedded in a larger discourse.

(32) Alex: Jordan had a lot of fun last weekend! They went to a party, they baked cookies, and also they broke their deadlifting record!

Brady: No, they baked and went to a party the weekend before last. This last weekend they stayed in. But I'm excited to hear about their deadlifting record!

The example in (32) gives an example where *also* is presupposing two propositions that have not yet been entered into the CG, which is shown by the listener then overtly rejecting them. But as the examples we just stepped though showed, *also* cannot presuppose the truth of propositions from the speaker's DC. Therefore, given that *also* is felicitous here, it must be able to presuppose the truth of propositions from whatever other object in the discourse also contains those previous propositions, which should be the Table. I must acknowledge that analyzing these sentences as not yet having entered the CG is not necessarily a given. It is entirely possible that in the correct analysis of (32), the party and baking propositions are already added to the CG when *also* is used, and then Brady's response necessitates downdating the CG. This seems possible, but unlikely, as

the PS should probably not contain supersets of the CG. These cases are undoubtedly interesting ones, but they are equally undoubtedly not minimal ones, so I will be ignoring them here.

the conjunction in the above example should likely be interpreted as the speaker attempting to add multiple propositions to the CG simultaneously, rather than as the speaker leaving space for interlocutors to agree or disagree between each proposition. So to follow the assumption that the three conjoined propositions do not go one by one into the CG before the next one is lined up, the example in (32) gives evidence that the propositions presupposed by *also* may include propositions that have not yet entered the CG or an interlocutor's DC. This leads me to conclude that the *also* presupposes the truth of some proposition, which is in the set $(CG \cup T)$, where T indicates the Table, and in that way includes any propositions that are not yet entered into the CG or a DC.

To restate what a denotation of discourse *also* needs to included, when combined with a proposition *p*, discourse *also* needs to assert only *p*. It then needs to presuppose the existence of some other proposition *q*, which is drawn from the $(CG \cup T)$. This cannot be just any proposition, as that presupposition would be vacuously satisfied in any discourse where *also* appeared later on than the very first sentence. Rather, they must be propositions that contribute to the same topic, in as untheoretically-laden terms as I can manage. In terms of the Table format from Farkas & Bruce (2010), the QUD goes in the section of the discourse called the Table itself. However, for the data that they are modeling, they are looking at overt questions such as *Is Sam home?*, and not so much on topic setting assertions like *I had a lot of fun last weekend*. As far as I know, later work on the topic also focuses on the control case of simple questions, rather than looking at more complicated ways of setting discourse topics. In the cases where the topic is set as something like *I had a lot of fun last weekend* and then the following list of questions are adding detail to how that happened, this can be considered as answering subquestions of the question *how did I have fun last weekend?*. Thus this kind of topic setting could be considered as raising an implicit QUD asking for more details. However, this question of how are QUDs set without explicit questions is out of the scope of this work at this time, particularly as the Table format I am working in places questions in the Table section of the discourse. So to slightly simplify the example we are working with, consider the adjusted discourse below.

(33)   Alex: What did you do this weekend?

        Brady: I went to a party, I baked cookies, and also I broke my deadlifting record!

In (33), an explicit question is raised as the QUD by Alex. As a question is modeled as the set of its answers (Hamblin, 1973; Karttunen, 1977), this places this set of propositions on the Table. The thing in common between all three of the propositions that Brady responds with is that all three are partial answers to this QUD. Therefore, a way to model that discourse *also* must follow at least one other proposition that is in response to the same question is to, in addition to requiring it follow some q in $(CG \cup T)$ is to require that p and q are both members of an existing QUD currently on the Table. This is effectively a restriction on C, considering that q is drawn from C, and that p is a felicitous assertion if it addresses a QUD on the Table. Consider the following general denotation for typical uses of *also*, where a C is included, but it is not yet formalized how it is "contextually defined".

(34) $[\![\text{also}]\!] = \lambda p \underline{\exists q : q \in C \land q \neq p \land \check{}q}.p$

The denotation in (34) is simply a basic denotation for any use of *also*; it applies to a proposition p, asserts p, and presupposes the truth of some proposition q (which is distinct from p) from C, the set of alternatives that is a contextually restricted subset of the focus semantic value of the proposition. For propositions with focus lower than proposition level, this should work just as Rooth described. The prosodically focused element generates a set of alternatives for the focus semantic value, and from that point up the tree, a non-singleton focus semantic value is available. At the top, we should have the ordinary semantic value of whatever the proposition itself is, and the focus semantic value of a set of propositions identical to the given proposition with the exception of the focused constituent. So for example, we expect a proposition like in (35) to generate a set of alternatives like below.

(35) $[\![\textbf{Erica} \text{ also baked cookies.}]\!]^{\text{f}} = \left\{ \begin{array}{l} \text{Erica baked cookies} \\ \text{Kaylin baked cookies} \\ \text{I baked cookies} \\ \text{Kevin baked cookies} \\ ... \end{array} \right\}$

In Rooth's theory, the focus semantic value is then restricted to what's contextually relevant. In this case, the set of propositions is already very restricted, so a loose definition of "contextually relevant" of simply excluding any individuals that cannot be relevant to the discourse would be enough to make sure that *also* is not vacuously satisfied. Applying *also* to this proposition asserts *p* and presupposes that some other proposition from this set is true, which is perfectly informative, so at a glance, no further restriction is strictly needed to make the usual denotation for *also* work. However, we expect a proposition with proposition level focus to, before contextual restrictions, generate an unrestricted set of alternatives, full of all possible propositions. Limiting it to propositions that are in some way related to the context is not restricted enough, in case that could restrict the alternative set, but to include propositions like in the example following.

(36) $[\![\text{Also, Erica baked cookies.}]\!]^{\text{f}} = \left\{ \begin{array}{l} \text{Erica baked cookies} \\ \text{The oven is working} \\ \text{Cookies are things that can be baked} \\ \text{Erica is someone I know} \\ ... \end{array} \right\}$

The propositions in (36) are all ones that are immediately relevant to the context of the proposition *Erica baked cookies*, but they are also ones that will make the presupposition of *also* vacuously true. So simply restricting to propositions that are "contextually relevant" will be too broad still, and the discourse restriction I have fleshed out is needed. In order to make this set of alternatives informative, C is restricted to propositions that are answers to a QUD on the Table, and in $CG \cup T$. To write out the restriction formally, this gives us (37).

(37)   **Discourse restriction for *also***: $C \subset (QUD \cap (CG \cup T))$

This restriction expresses the idea that the discourse itself is determining what counts as strictly "relevant", and it does so in a way that combines a formal representation of objects in the discourse with a pretheoretical idea of "on topic". Formally speaking, the propositions in C are limited to the intersection of the propositions in the QUD and in either in the CG or on the Table. Given that a question's denotation is the set of its answers, this requires that all of the propositions in C be answers to a question on the table. Additionally, all of the propositions are required to be either in the CG or proposed to enter the CG. The Table and the QUD(s) on it can be thought of as setting the topic for the discourse. The point of the conversation that this represents is is to answer these questions, because then they can be removed from the Table, as their answers go into the CG. By *also* requiring that C contain an answer to the QUD that is already in the CG or proposed to enter the CG, *also* provides an informative presupposition that flags that p is a continued answer to a current QUD, that this QUD should not have been removed from the Table yet, and that this topic is still under discussion. If the previous QUDs were fully resolved with no further answers to give, and if p were a topic change or in response to a new and unanswered QUD, then it would be infelicitous to use. To illustrate this, look at the example set in the following example.

(38)   Alex: What did you do this weekend?

Brady: I went to a party, I baked cookies, and also I broke my deadlifting record!

C for $[\![\text{I broke my deadlifting record.}]\!]^{\text{f}} = \left\{ \begin{array}{l} \text{I broke my deadlifting record} \\ \text{I went to a party} \\ \text{I baked cookies} \end{array} \right\}$

All three of the propositions Brady said are on the Table, and all of them are answers to the QUD Alex posed. So their use of *also* presupposes the truth of one of the non-p propositions, which accurately matches the felicity requirements for discourse *also*. In addition, this presupposition is now an informative one, and using it makes it clear that p is in continued response to a QUD. The effect is also one that accurately matches our overall goals for an analysis of discourse *also*: the correct truth conditions and presuppositions are realized, the effect of flagging the continuation of a topic or list is realized, and the analysis is compatible with a basic analysis of *also* as a FSP. One

slight looseness with this analysis is that intuitively, in order to get this 'list of answers' effect, p needs to be an answer to *the same* QUD as q is an answer to, and it is not immediately clear that this is required by the current restriction if it refers to *any* QUD. I will for readability continue to use this same notation, but realistically the QUD part of this restriction needs to be interpreted as specifying *a* QUD. According to Rooth (1992), C needs to be a set that includes the ordinary semantic value and at least one other proposition, meaning that if we look at this QUD variable in (37) as referring to (the set of answers for) one question only, it must necessarily be the question that p is an answer to.

This analysis is so far agnostic as to where this restriction is located, or when it applies to take the focus semantic value and return C. Looking at uses of *also* with smaller constituents focused the alternatives produced for the focus semantic value already seem restricted enough that the presupposition of *also* is informative. However, I will show that *also* is only ever felicitous when following this discourse restriction, even when smaller constituents are focused. Consider a typical use of *also* with a smaller constituent focused in (39).

(39) Alex: We're low on office supplies. Did you buy some?

Brady: Yes, I bought pens! I also bought **paper**, since it turns out I was out of that too.

In (39), *paper* is focused, which will make the focus semantic value of this proposition a set of propositions of the exact same shape, but varying in what is where *paper* is in the original proposition. This is much more restricted than what proposition level focus would generate without further restriction, and so again there is no immediately apparent need for any discourse restriction further than ignoring outlandish or totally unrelated propositions. However, examining uses of *also* like in (39) shows that the same restriction is in fact still in play: *also p* must follow at least one proposition that addresses the QUD and is in $(CG \cup T)$. In this case, the explicit QUD is whether Brady bought office supplies, and Brady's first sentence answers that and is on the Table before they use *also* in the next sentence. It is hard to prove the absence of something, and simply giving more and more examples of uses of *also* that follow this restriction is not going to do it. But we can talk through the idea at least. Uses of *also* are licensed when p follows some other q from its C.

Effectively, all uses of *also* appear in a list environment. Discourse *also* with its proposition level focus is the one that stands out in that its list environment is not immediately apparent because its *C* is not immediately clear, and this is reasonably obvious for uses of *also* with lower focus. The part of my proposed restriction that ensures that *also* appears toward the end of a list is the part that restricts *C* to propositions in $(CG \cup T)$. If *also* with lower focus did not follow this restriction, we could expect it to appear toward the beginning of a list instead of at the end of one, because *q* would not have to have been already stated.[3]

(40)   # I also bought **pens**. I bought paper. I bought a lot of things!

The example in (40) shows that *also* with lower focus cannot appear at the beginning of a list environment, as it is infelicitous there. Instead, it must appear at the end of the list, like discourse *also*. So it appears to also be following the restriction of limiting *C* to propositions in $(CG \cup T)$. The other part of the restriction limits propositions in *C* to only ones that are answers to the same QUD. To think about this one specifically, if an assertion does not address a QUD in some way, it is not a cooperative discourse move (Roberts, 2012). As a reminder, this part of the restriction was introduced for discourse *also* as a way to handle the fact that it is not licensed when changing topic, unless still answering an overarching QUD. So for discourse *also*, this restriction is needed to say that *p* and *q* address the same QUD. With lower uses of *also*, does it have to be the same QUD for *p* as for *q*? Consider the following discourse.

(41)   Alex: What kind of pet do you have?

        Brady: I have a black cat.

        Alex: Cool, **my sister** also has a black cat!

In (41), Alex's proposition using *also* and focusing *my sister* does not address the explicit QUD for the conversation, but it does not sound infelicitous, and this sounds like plenty of real

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[3]I am ignoring difficult cases where things may be entered into the CG in ways other than interlocutors saying them. I am sure there is a relevant case where someone can meaningfully gesture to a pile of pens, and then the other person say *I also bought pens*, but I am equally sure I would rather deal with clearer cases when trying to make my point, and it is reasonable to ignore those cases.

conversations I have heard. I worry, however, that this might be due to the flexibility of natural conversation, outside of toy examples, and the ease of expanding the topic to something more like *pets that people have* from the original topic of *pets that Brady has*. In this example, the interlocutors are likely willing to simply accommodate such a small expansion in the QUD. To address the issue of flexibility in topic, I have composed an example that is admittedly slightly unrealistic in regular conversation, in an effort to very strictly limit a model conversation to one that will not change topic so easily.

(42)   Alex: I have a new garden, and it gets full sun. Therefore, I wish to get your advice on what flowering plants are suitable for planting in full sun, because I want to plant flowers specifically. What flowers like full sun?

Brady: Sunflowers do well in full sun.

Cameron: **Cedar trees** also do well in full sun.

The example in (42) tries to very strictly limit the conversation to staying on the explicitly declared QUD of flowering plants that like full sun by emphasizing both the full sun and the flowers requirements. As a result, Cameron's use of *also p* comes off at best as changing the topic, and at worst uncooperative, if not infelicitous. This likely means the example in (41) would have been strictly infelicitous with conversation participants who inflexibly stick to one QUD at a time, but it comes off as acceptable because realistically speaking, interlocutors switch easily between QUDs and topics. With stricter interlocutors, like in (42), switching QUDs between q and p is more clearly disallowed. To take the strict stance, I am comfortable asserting that uses of *also* with smaller constituents focused are also subject to the restriction that p and q must address the same QUD. I am less comfortable dealing with how interlocutors are willing to accommodate expanding or changing QUDs or topics without explicitly declaring them, but luckily I think that the intricacies of different ways to do that without explicitly asking a new question are outside of the scope of this work, so I am not going to deal with this way that it muddies the water.

Given that all uses of *also* follow this restriction, I argue that this is lexically encoded, rather than this restriction being a discourse principle that *only* comes into play with proposition level focus.

Rather, proposition level focus creates the conditions in which this restriction becomes apparent. When smaller constituents are focused, the alternatives in C are already much more restricted, and some elements of this restriction are hard to distinguish from simply being a cooperative interlocutor. As a result, I propose a denotation for *also* as in (43) below.

(43) $[\![\text{also}]\!] = \lambda p \underline{\exists q : q \in C \wedge q \neq p \wedge \text{\v{}}q}.p$

where $C \subset (QUD \cap (CG \cup T))$

The denotation above in (43) is the same as the above denotation. However here, C is shorthand for a precise subset of the focus semantic value of the proposition, rather than a contextually restricted subset of it. Above I have specified that by defining C as a subset of the objects in the discourse that I have argued make up its restriction, the QUD and $(CG \cup T)$, and specifically it is a subset of the focus semantic value of the proposition, so it could also be written as the intersection of the focus semantic value and the restriction. This does mean that the variable C is not strictly needed anymore, if it is shorthand for the intersection of these things that the interlocutors have access to. We do not yet have a broad enough analysis from which I could propose eliminating the variable C from all analyses of focus, so I do not wish to take that stance at this moment, but if that were a reasonable expansion then this would allow us to no longer worry about the issues it raised such as where is it structurally located, and how is it formed. This is a goal I would like, but to make more modest statements for the moment about the outcome of an analysis like this, eliminating C does at least mean that for an analysis of *also* we no longer need to worry about how the contextual restriction is formed. We could rewrite the denotation to this following version, and not rely on any "contextual restriction" at all.

(44) $[\![\text{also}]\!] = \lambda p \underline{\exists q : q \in ([\![p]\!]^f \cap QUD \cap (CG \cup T)) \wedge q \neq p \wedge \text{\v{}}q}.p$

The version in (44) removes C altogether from the denotation. In addition to the advantage just discussed, this means that for this analysis at least, we do not have to worry about where C is syntactically located, even if this analysis does not mean that we can dismiss this issue from all analyses of focus as a whole. However, this version without C in (44) does have a possible related

downside. All analyses of focus can be unified by including a shared element, C. Taking that element out of the denotation could make the link between this analysis of *also* and other things involving focus less clear. This is more of a potential downside in terms of having a beautiful theory where the relation between related elements stands out clearly, and not an issue in terms of predictions and dealing with the data. Furthermore, it may not be an issue at all. While I have not done analyses of all other focus phenomena, it is entirely possible that all of them can be reframed in their analyses to include $[\![\alpha]\!]^{\text{f}}$ instead of C, and then the former could be the new unifying element across all focus phenomena, which is an endpoint that I would appreciate. That said, while I appreciate this goal of eliminating C, I am for the moment going to continue to work with the formalism in (43) instead of the one in (44), because I plan to investigate other phenomena that involve focus and have current analyses with a C in them, and while the result may be that it can be dismissed in all cases, it will be easier to work toward that conclusion instead of assume it from the start.

This wraps up the immediate analysis for discourse *also*. The next step is to consider the other phrases that do discourse addition, and see if this analysis can be extended, or if some enlightening issue pops up. If this restriction is lexically encoded, then if other phrases behave in the same way, chances are they should encode the same restriction. Recalling that *also* and *too* tend to be analyzed identically, this extension looks easy. But recalling also that a variety of expressions actually share this pattern, not just *too*, I will explicitly step through this in the following section.

3.4.2 Extending this to other instances of discourse addition

The analysis in Section 3.4.1 revolves around the fact that *also* is a Focus Sensitive Particle, as it is a very prototypical FSP and well studied. However, as a reminder, several other words or phrases acted in a similar way in terms of discourse addition. The previous data showing the variety of expressions that do discourse addition is repeated below.

(45) I did a lot of things last weekend! I hung out with friends... I went for a walk...

a. $\left\{\begin{array}{l}\text{Also}\\\text{Additionally}\\\text{In addition}\\\text{Furthermore}\\\text{Moreover}\\\text{What's more}\\\text{To top it off}\end{array}\right\}$, I baked cookies!

b. I baked cookies $\left\{\begin{array}{l}\text{also}\\\text{as well}\\\text{in addition}\\\text{too}\\\text{to top it off}\end{array}\right\}$!

Despite the fact that I began this analysis with *also*, it is significant to remember the morphological link between discourse addition and the degree addition / event summing ambiguity in some of this data, where we see variations on *more* and *addition* and *on top of / to top it off* reappearing (in slightly syntactically different ways). Even though no clear compositional link has appeared in the analyses between this chapter's analysis and the previous chapter's, I would like to maintain some continuity by looking at an *addition* phrase and a *more* phrase in this section specifically However, these words and phrases are not ones that have appeared in research on focus, nor are they ones that are particularly well known as expressions that exhibit focus sensitivity. If all of these expressions are focus sensitive, and act like other FSPs, then the analysis could be directly extended. However, if some or all are not focus sensitive, then they would necessarily require a different analysis from the one that I proposed for *also*. To start with an easy argument in favor of extending the same analysis to more of these expressions, *too* is a prototypical FSP that appears in focus literature almost interchangeably with *also*, so it follows that an analysis for one would work for the other. I also showed some data in Section 3.2 indicating that *as well* shows focus sensitivity. Now, in order to determine whether *in addition* is focus sensitive like *also*, consider the following data.

(46) Alex: I **baked** cookies {in addition / also}.

Brady: Wait...

    a.   What else did you do with cookies?

    b. # What else did you bake?

(47) Alex: I baked **cookies** {in addition / also}.

Brady: Wait...

    a. # What else did you do with cookies?

    b.   What else did you bake?

(48) Alex: I **baked** cookies.

Brady: Wait...

    a. # What else did you do with cookies?

    b. # What else did you bake?

The above data shows two sets of minimal pairs, and marks whether the two given responses are felicitous. The examples in (46) and (47) both include *in addition* (and *also* to compare), and they differ based on where the prosodic focus is, as a FSP changes interpretation based on what constituent is prosodically focused. The examples in (46) and (48) have the same constituent focused, but they differ on whether or not *in addition* and *also* are included, so we can see if *in addition* is making a contribution to the sentence like *also* does, or if the prosodic focus alone could be doing the work or creating these felicity conditions. Looking at the (a) and (b) response options, in all of these cases they are intended to probe whether *in addition* has the same FSP presupposition as *also*, where *also* asserts p but presupposes the truth of some other proposition q from the set of alternatives C. If *baked* is stressed, then C should be filled with propositions of the form *Alex (verbed) cookies*, but if *cookies* is stressed, then it should be filled with propositions of the form *Alex baked (something)*. The (a) response flags a failure of presupposition of the first shape, and the (b) response flags a failure of presupposition of the second shape. The (a) response is felicitous

and the (b) response infelicitous for both *also* and *in addition* in (46), but for (47), the reverse is true and the (a) response is infelicitous and the (b) response felicitous for both expressions. What this shows is that *also* and *in addition* are patterning identically with respect to their presuppositions. To compare (46) to (48), neither the (a) nor (b) responses are felicitous in (48) without *also* or *in addition* in the preceding section. Therefore, it is not a presupposition that focus can bring up by itself. Instead, *in addition* must be having the same focus sensitive presuppositional contribution as *also* does.

Given that *in addition* is acting in a focus sensitive way identical to *also*, we can extend the same analysis to it that I proposed in the previous section for *also*. That is, it could functionally use the same FSP denotation that I used for *also*. The final denotation for *also* is repeated again for *in addition* in (49), with the presupposition underlined again.

(49) $[\![\text{in addition}]\!] = \lambda p \underline{\exists q : q \in C \wedge q \neq p \wedge \check{}q}.p$

where $C \subset (QUD \cap (CG \cup T))$

It is not worth repeating the analysis wholesale here, as the identical denotation in (49) should act identically to the one in the previous section. That is, the same discourse restriction would effectively restrict *in addition* to appear only in the same contexts in the same way. And again, I argue that this restriction is clearly apparent with proposition level focus, but it is also present with smaller constituents focused as well. To repeat the example from the previous section but with *in addition*, here is a discourse with a smaller constituent focused.

(50) Alex: I have a new garden, and it gets full sun. Therefore, I wish to get your advice on what flowering plants are suitable for planting in full sun, because I want to plant flowers specifically. What flowers like full sun?

Brady: Sunflowers do well in full sun.

Cameron: **Cedar trees** do well in full sun in addition.

Like with *also*, given a discourse like (50) which strictly defines the QUD, *in addition* must follow at least one proposition that addresses the same QUD. That is, *C* is restricted to propositions

that are in the QUD (as answers) and are in the CG or on the Table. As a result, Cameron's sentence with *in addition* in (50) comes off as a topic change or an uncooperative answer because *in addition* is infelicitous.

To take one more step, the same tests can be extended to one of the expressions with *more* in it, although the judgments are less clear.[4]

(51) Alex: Furthermore, I **baked** cookies.

  Brady: Wait...

  a. What else did you do with cookies?

  b. # What else did you bake?

(52) Alex: Furthermore, I baked **cookies**.

  Brady: Wait...

  a. # What else did you do with cookies?

  b. What else did you bake?

In these cases, the judgments seem to be on the same page as for *in addition* and *also*, but these ones are less clear. Minimally, the ones that are marked as infelicitous are definitely not good responses. The ones that are not marked as infelicitous are acceptable responses to the given statements, but they are perhaps not the most likely ones. The stress in either (51) or (52) is oddly easy to interpret as contrastive focus to correct a previous statement, given that there seems to be no reason why any particular stress out of the blue should be likely to get this interpretation. That is, a response like *Wait, I never claimed you did otherwise* is perfectly good as well, and if anything, seems very natural. To come back to that, given that the unmarked responses are appropriate, this shows that *furthermore* can be acting the same as *also* or *in addition* in terms of its presupposition. If *furthermore* can act the same in terms of a focus sensitive presupposition, then again the same analysis can be extended here. However, why might this "correction" reading

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[4]At least I simply do not have *moreover* in my dialect, and I find *what's more* to be interpretable but distracting due to its register or something similar.

be more likely here than in other places? One possibility is that *furthermore* has some other use besides the FSP / discourse addition use that I am focusing on here, and the possibility of that use is being considered as well. Alternatively, at least in my dialect, the variations with *more* in them are uniformly less frequent than the options with *addition* in them, if not totally missing. They could seem odd to me as a function of being low frequency in American English, although that is a less theoretically interesting hypothesis. Rather than exhaustively stepping through each and every expression that conveys discourse addition, and examining the gradience in how natural each one is for any particular dialect, I think this is a good stopping point. My analysis does not have any predictions with regards to gradience, and gradience in semantics is out of the scope of my research. Here I have shown that multiple expressions that can be used for discourse addition also have a reading with the same focus sensitive presupposition as *also*, meaning that the analysis from the previous section can be used successfully for more discourse addition expressions.

To step back and think about what this means as a whole, first this analysis has given evidence first for the existence of proposition level focus. The analysis involving focusing the entire proposition relies on using objects in the discourse to restrict C, which then makes it clear what it means in a formal sense to "contextually restrict C". Although the restriction is much clearer when the proposition is focused than when a smaller constituent is focused, I then showed that in each case, that restriction applies to uses of the FSP with smaller constituents focused as well. This supports reanalyzing the denotation of FSPs like *also* in all cases to add this contextual restriction, rather than proposing a special theory to deal with proposition level focus. Finally, I showed this restriction to extend to all uses of focus sensitive discourse addition expressions. So this analysis makes some contributions and some predictions. If these FSPs have this kind of restriction based on objects in the discourse, then other FSPs could also have restrictions based on objects in the discourse. This restriction applying to all uses of *also* is also an argument for it being lexically specified, rather than it being some kind of principle that is relevant when the proposition is focused. The fact that multiple expressions all have the same restriction might be an argument in favor of a broad principle instead of a lexical specification, however. To tease apart these two options, it is worth looking at

other FSPs, and asking whether they have the same restriction or not. Minimally, the prediction is that they *can* have restrictions that reference objects in the discourse. However, whether or not they have the *same* restriction is the next interesting question. Toward this end, the next section of this chapter investigates another FSP use with proposition level focus.

One more issue to discuss for this analysis is that it sheds no light on the morphological link between this data and the additivity data from Chapter 2. The sheer amount of morphological links makes it look like this analysis is missing something in this way; assuming all of those are simply coincidence would be quite a lot of coincidence. However, my analysis at this time leaves open exactly what the link is.

3.5   Concessive *only*

The analysis in the previous section makes predictions that this section intends to test. Specifically, if *also* can have proposition level focus, then so could other FSPs. Additionally, if proposition level reveals how objects in the discourse restrict *C* for *also*, then it might reveal similar kinds of restrictions for other FSPs, but minimally these kinds of restrictions *must* be possible. These predictions bear out with concessive *only*. The "usual", well studied use of *only* asserts that while *p* is true, no other *q* from the alternative set *C* is true. To see this, consider the data in (53), which gives a minimal pair of sentences differing only in where the prosodic focus is.

(53)   a.   I only ordered **pens**.

b.   I only **ordered** pens.

In (53a), this is false if I ordered anything in addition to pens, but in (53b) I could have ordered a whole host of other office supplies. In contrast, (53b) is false if I did anything else with pens, such as unpack or refill them after ordering them. This is the "typical" use of *only* which displays clear focus sensitivity. The other discourse / concessive use that I am interested is the one that appears in the following two examples.

(54)   I wanted to bake, only I didn't have any flour.

(55) I would go to your party, only I'm busy then.

In the used of *only* in (54) and (55), as with discourse *also*, note that there's no need for prosodic stress anywhere in the proposition with *only*. Instead, it seems to impressionistically mean something along the lines of "the only thing stopping the previously asserted thing from happening is *p*", with a concessive feel.

In Section 3.5.1, I will first step through a little more data to flesh out where we see concessive *only*, and in the Section 3.5.2 I will walk through the actual analysis. In the analysis section, I will first go through a first hypothesis showing that an analysis does not need to propose any new theoretical notions, but then I will propose another hypothesis showing that the analysis is a better fit if I do propose one new notion, that of impediments to a goal.

3.5.1 Further data

The primary important quality of concessive *only* is that *only* is typically focus sensitive, and that this use does not appear to be. To step through a few other observations worth mentioning, it seems to preferentially appear with modals, but the appearance of a modal is not totally necessary, as (56) shows.

(56) a. I went to the party, only I had to leave early.

b. I went to the party, only I left early.

In (56a), a modal does appear, but in the conjunct following *only* instead of the one before it. In (56b), the modal is removed, and this sentence is still acceptable without any, although perhaps not quite as good as the (a) version. The impressionistic paraphrase of "the only thing stopping the previously asserted thing is *p*" does not seem to quite hold here anymore, either. Instead, they seem to acquire a metalinguistic flavor of something like "the only thing that stopped me from wholly counting as having gone to the party is *p*" or "I went to the party in all ways that count, except *p*". This use seems less natural to me, but still acceptable.

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Along the same lines, concessive *only* very often appears with negation, helping give it this concessive flavor. Either there is overt negation, as in (54), or like in (55), it often appears with words like *busy*, which can be rephrased as *not free*. This pattern of negation will be returned to in the analysis later. To continue to step through slightly more data for now, *only* appears in one other syntactic position with this concessive reading. It can appear before the proposition, as we have seen, or it can appear in a cleft-like position after *it's*.

(57)   a.   I wanted to bake, only I didn't have any flour.

         b.   * I wanted to bake, I only didn't have any flour.

         c.   I wanted to bake. It's only that I didn't have any flour.

         d.   * I wanted to bake. Only it's that I didn't any flour.

As (57) shows, concessive *only* can appear high, but not lower in the sentence (with this intended reading), or it can also appear in a position like a cleft after *it* as well, and with the same meaning. This position is not exactly a cleft because it is not clear what it is a cleft of, or what it is clefting out of, but it is clear that this is another high position at least. So in either case, it seems to be appearing high and interacting with a clausal argument. In (57a), *only* appears to be conjoining two propositions, but the two propositions do not need to appear in the same utterance.

(58)   Alex: I want to bake.

        Brady: Only the oven is broken. (So you can't.)

The two sentences in (58) are spoken by different interlocutors. So *only* is not conjoining two sentences, and cases like (57a) are likely due to a writing convention rather than an indication of a type of conjunction. Related to the question of conjunctions, some of these sentences are paraphrased well with *but*, *except*, or *just*, but these options have some syntactic differences from *only*.

(59)   a.   I wanted to bake, only I didn't have any flour.

         b.   I wanted to bake, but I didn't have any flour.

c.   I wanted to bake, except I didn't have any flour.

d.   * I wanted to bake, just I didn't have any flour.

(60) a.   I wanted to bake. It's only that I didn't have any flour.

b.   * I wanted to bake. It's but (that) I didn't have any flour.

c.   * I wanted to bake. It's except (that) I didn't have any flour.

d.   I wanted to bake. It's just that I didn't have any flour.

As can be seen above, *just* can't appear where *but* and *except* can appear, and vice versa. Specifically, (59) shows that *just* does not work in between two propositions, and (60) shows that *but* and *except* do not work in this cleft-like position. So none of these other options can appear in both the syntactic positions that *only* can appear in.

What ideas should we take away from these comparisons to bring to the analysis? Grice (1981) suggested that *but* is essentially *and* with the added conventional implicature that the second conjunct is surprising in light of the first, or it is unexpected, or something like that, which is a point that I will return to later. As for *except*, it makes sense to say that it's highlighting an exception, which is impressionistically in line with what *only* typically does in terms of it says p is patterning unlike the rest of its group. This kind of exception is exactly what the typical idea of *only* is if the group being considered is C. To restate that, the propositions in C are false, with the exception of p. To bring this back to the intuition about what concessive *only* is doing, it means something like the thing just asserted prior is the goal, and p is the only thing preventing that goal. This intuition of "the only thing stopping [this goal] is p" reflects the typical *only* pattern of 'p is true and no other q in C is true' if C is the set of things stopping this goal from being realized. At this point, an analysis can be worked out where concessive *only* is a form of regular *only*, as it can be interpreted as having the same T/F pattern as *only*'s assertion is typically analyzed as having. This is the direction I will be taking in the following section.

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3.5.2 Analyzing concessive *only* with proposition level focus and a discourse restriction

What I propose that concessive *only* is doing is that it is acting exactly like regular *only*, but again with proposition level focus. As with discourse *also*, this data shows C is limited in some way by elements in the discourse, which provides evidence for interlocutors tracking goals, and for a notion of impediments to goals. I will step through two main options for how to frame this restriction. First I show that if we incorporate structure from the conversational scoreboard model proposed by Roberts (2004) to the Table format we have been working with, this fits the data reasonably well. I next propose the notion of impediments to goals, and show that this slight loss of parsimoniousness allows for a slightly better fit to the data. I will also discuss whether this is a restriction that applies to all uses of *only* after.

3.5.2.1 Establishing domain goals for the discourse restriction

To start with, regular *only* asserts that p is true, and no other q from the alternative set C is true. If concessive *only* has proposition level focus, then if C were wholly unconstrained by the discourse then any proposition could be in it, making the sentence with *only* exceedingly unlikely to be true. As a reminder, solely limiting C to propositions that are "contextually relevant" without strictly defining that concept would be too unconstrained for a use of *only* with proposition level focus, leading to a possible alternative set like the following.

(61) Alex: I wanted to bake

Brady: Only the oven is broken.

$$[\![\text{The oven is broken}]\!]^{\text{f}} = \left\{ \begin{array}{l} \text{The oven is broken} \\ \text{There is an oven in this apartment} \\ \text{Alex wants to bake} \\ ... \end{array} \right\}$$

The alternatives in (61) are a handful of propositions that are directly relevant to the context of the oven being broken, and/or Alex wanting to bake, but this example set is still too unrestricted. The assertion from *only*, that no other q in C is true, will necessarily be false. The first thing to

check is whether we can extend the same restriction that *also* works with to an analysis of *only*. That is, is *only*'s *C* limited to propositions that are both answers to a QUD and in the CG or on the Table? I argue that it cannot be, as I have been unable to construct a context in which concessive *only* is able to follow an overt question.

(62)   Do you want to bake?

      a.   The oven is broken.

      b.   # Only the oven is broken.[5]

In (62), responding to the given question in an indirect way by objecting that the oven is broken is fine. However, as the given minimal pair shows, this response cannot be prefaced by concessive *only*. In addition, *only* cannot respond to indirect or embedded questions either, as the same acceptability pattern results in (63) below.

(63)   I'm asking whether we can bake.

      a.   The oven is broken.

      b.   # Only the oven is broken.

Unless concessive *only* were to somehow be sensitive to the clause types of whatever preceding proposition that sets the goal, even if that goal is set in embedded clauses too, this is evidence that it is not just the case that concessive *only* cannot follow a syntactic question. The issue must be the semantics of a question, which is analyzed adding a question/QUD to the Table (Farkas & Bruce, 2010; Taniguchi, 2017). While it is at the moment unclear why concessive *only* is wholly unable to respond to new QUDs, this does mean that extending the same analysis as *also* to *only* won't work without making changes. Questions were key to the analysis of *also*, as *also* listed further answer(s) to a QUD (even if the question does not have to be explicitly stated), but *only* cannot be an answer to a question. Instead, it is worth considering other ways of thinking about

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[5]People I show this data to often point out that this becomes perfectly good if prefaced with *yes* or *yeah*. However, if we analyze "Yes" as including an elided version of the proposition it agrees with, then this is actually *Yes, I want to bake, only the oven is broken*, which we expect to be acceptable (Kramer & Rawlins, 2009; Biezma & Rawlins, 2012).

topics, in which case it makes sense to think about something like *I want to bake* as setting a goal within a discourse. Recall that referencing goals in a discourse requires stepping aside from the Farkas & Bruce (2010) Table model of discourse to work with objects from the Roberts (2018) conversational scoreboard model. To consider for the moment the union of these two models, we have evidence for the semantics interacting with objects in the Table model, but a discourse does only make sense when interpreted with respect to items on the scoreboard such as the interlocutors and order of moves. There is some overlap between these two models in that both include space for a QUD, but this is overlap rather than contradiction, and there is no reason not to take this idea of goals and incorporate them into the Table model, and assume that the set of goals, G, is an object in the discourse that speakers can access.

To return to concessive *only* and to repeat the example from (61), we can think of Alex's statement as setting a domain goal of baking. Relevant responses to questions are ones that narrow the set of possible answers in some way, whether by giving options for what the answer is, or by ruling out what the answer is not, so it helps to use Roberts' work as a starting point for defining relevant responses to goal-setting moves. A relevant follow up move to a goal setting assertion could be to ask questions that would enable the goal, but assertions can be relevant responses to goal-setting assertions as well. With the example goal of wanting to bake, questions investigating how to go about this should be relevant responses. But to think about assertion responses, perhaps some appropriate responses would be as follows.

(64) Alex: I wanted to bake.

$$\textit{Relevant assertion responses}: \begin{Bmatrix} \text{I have a mixer} \\ \text{I have flour} \\ \text{The oven is working} \\ \text{...} \end{Bmatrix}$$

The example responses in (64) are all about things that enable the goal that Alex set, and they are all appropriate responses for an interlocutor to make. While it may be odd to assure an interlocutor that your oven is working unless there is a worry that it might not be, if it is unknown whether or

not there is a functional oven available, this is a perfectly natural response assuring Alex that their goal should be achievable. Another way of thinking about what assertions are relevant is if you consider that Alex might follow up their statement of baking intentions by asking what they need in order to realize their goal, all of the assertions in the given set are both relevant and felicitous in response to a general question about how to realize this goal. To work with this set of relevant responses for the moment, this set is not a discrete object in the discourse with the current theory, not in the same way that the Table or PS or goals now are. However, it is intuitively relevant to our understanding of *only*, so I will return to Roberts' formalization here in an effort to define this set in a way that a speaker should be able to access. If we assume that speakers keep track of domain goals, as Roberts does, then we can acquire this set by formally defining relevance to a goal, and then taking the set of propositions that are relevant$_g$. To start with the tools already available, I repeat how Roberts (2018) defines relevance with regards to questions as in (65).

(65) Given QUD q, a move m is **Relevant** iff m addresses q.

This definition of relevance requires a QUD, not a domain goal, and as discussed, *only* strictly cannot follow a question. If I wanted to stick to this definition, we could follow Roberts in assuming that bringing up a new goal implicitly brings up a new QUD of *how to achieve this goal*, or something like that, which does seem reasonable. However, this would then bring up the issue of why *only* can only deal with implicit questions, not explicit, which seems like it is going in the wrong direction. Instead, I want a definition of relevance that does not rely on a QUD, but rather on that follows a goal instead. To make a slight modification to Roberts' definition, the following is a definition for the notion of relevance with respect to a domain goal in the given discourse.

(66) Given domain goal g, a move m is **Relevant**$_g$ to g iff m addresses how to realize g.

To work with this definition in (66), we can describe the example set we've been working with as the set of propositions which when asserted are relevant$_g$ moves in response to the just established goal. If a speaker has the notion of relevance$_g$, then it stands to reason that they can access this notion via a function. With discourse *also*, the "contextually relevant" propositions were the ones

already listed, but with concessive *only*, we want a set of propositions that are relevant$_g$ to the same goal, as defined by a relevance$_g$ function. As the definition in (66) defines it, relevant$_g$ to a goal g means it addresses how to realize g, and there is some wiggle room in what it means to "address how to realize g". As I will discuss in more detail later, I do not think individual interpretations of what addresses how to realize a goal g will be a problem, but it does bring up an issue in terms of how we should interpret "address" in the theory. In a nutshell, the question is whether both p and $\neg p$ should be relevant$_g$ to the same goal g. Thinking about negation, consider the two sets of propositions given for the following example sentence.

(67) I wanted to bake, only I didn't have any flour.

a. $\left\{ \begin{array}{l} \text{I have no flour} \\ \text{I have no mixer} \\ \text{I have no oven} \end{array} \right\}$

b. $\left\{ \begin{array}{l} \text{I have flour} \\ \text{I have a mixer} \\ \text{I have a oven} \end{array} \right\}$

The propositions in the (a) option have the negation pattern of the *only p* proposition, and the ones in the second option have the negation removed for the set. Between the two options, the (b) set, the one lacking the negation, is the one that seem more likely to be responses that are relevant$_g$ to the goal with our given definition of relevance$_g$. Based on that, one way to think about the (a) set, the ones matching the negation pattern, is that these are propositions that would block that goal. However, remember that concessive *only* does not always appear with overt negation, although it often does. As (68) reminds us, concessive *only* often appears with a word like *busy* instead of overt negation.

(68) I would go to your party, only I'm busy then.

a. $\left\{ \begin{array}{l} \text{I am busy} \\ \text{I am disinterested} \\ \text{I dislike you} \end{array} \right\}$

b.
$$\left\{ \begin{array}{l} \text{I am free} \\ \text{I am interested} \\ \text{I like you} \end{array} \right\}$$

Instead of thinking of the (b) sets as the ones lacking the negation, in light of (68) it definitely makes better sense to think of them as propositions that block the goal rather than specifying a negation pattern. Intuitively, the set propositions that *enable* the goal are absolutely relevant$_g$ in that they relate to realizing it, but are the ones that *block* the goal also relevant$_g$? Going back to Roberts' definition for relevance for questions, a move is relevant if it addresses a question, and that phrasing shares this same issue. It makes sense that you can respond to a question with a clear answer, but another felicitous response to a question is ruling out options.

(69)   Who is going to the party?

    a. Erica and Will are going, at least.

    b. Erica and Will aren't going, at least.

Felicitous responses to the question in (69) include answers that are not exhaustive, but narrow the set of possible answers. This can be done with a partial answer like (69a), which rules out answers that do not include Erica and Will, but an answer like (69b) which rules out answer that *do* include Erica or Will is also felicitous. If we take this pattern and apply it to relevance$_g$, it makes sense that a helpful response to a goal could also be flagging what blocks it from realization. This means that both the positive and the negative sets should count as assertions that are relevant$_g$ to the given goal. However, this makes impossible predictions of concessive *only*. Consider a set of propositions like the following one, which include both the propositions that enable the goal and the propositions that block the goal.

(70)   I wanted to bake, only I didn't have any flour.
$$\left\{ \begin{array}{l} \text{I have no flour, I have flour} \\ \text{I have no mixer, I have a mixer} \\ \text{I have no oven, I have an oven} \end{array} \right\}$$

Recall that *only* is analyzed as asserting that p is true, and no other q from the set of alternatives is true, and that the hypothesis here is to extend the usual use of *only* to concessive *only* and say that the discourse limits C to the set of relevant propositions. If C is limited to the relevant$_g$ propositions, with a set of relevant$_g$ responses like in (70) *only* would assert that contradictory propositions, such as *I have no mixer* and *I have a mixer* for example, are both false. This is an assertion that cannot be true with this hypothesis and this assumption about relevance. I intend to test another hypothesis, but I would like to first fully explore the possibility of making this analysis work with the tools like relevance$_g$ that we can assume when we import goals, so we will work with this slightly longer anyway. To avoid impossibilities, I am for the moment going to instead make the assumption that only the positive set is returned by a relevance$_g$ function, and negations are "relevant" in terms of excluding members of the positive set, rather than by being members themselves. However, the focus set is supposed to include the focused item itself, and if the focused item is a negative proposition, then it would not be included. We also do not want C to be restricted to the set of propositions that are not relevant, because this would allow too many vacuously true propositions in and make *only* impossible to make true again. Effectively, we want C to be a set of the propositions that are relevant to the goal, negated. This is a restriction we can formalize based on the objects in the discourse, but it is worth mentioning that it seems to be an oddly specific. While I intend to try out other options, the first version of the discourse restriction for *only* is as follows.

(71)   **Discourse restriction for *only* v1**: $C \subset \{p|\text{RELEVANT}_g(\text{ASSERT}(\neg p))\}$

The restriction hypothesized in (71) limits C to only propositions that if negated are relevant to the goal when asserted. With this restriction, a denotation for regular *only* should work totally unimpeded; it affects only how the C is interpreted. This follows the same pattern as the analysis of discourse addition in Section 3.4 laid out: a basic FSP denotation is provided, and then instead of relying on a vague notion of context to limit the focus semantic value to a realistic C, a restriction based on what objects are in the discourse is proposed. Toward that goal of continuing this pattern and supporting that analysis, the general denotation for *only* that I intend to use is provided in (72).

(72) $[\![only]\!] = \lambda p \forall q : q \in C \wedge q \neq p[p \wedge \neg q]$

The denotation in (72) works for general cases of *only*, also applying at the proposition level, for convenience. Here, it takes in a proposition, and asserts for all propositions p which are in C but are not equivalent to p, p is true and q is false. That is, p is the only proposition in C that is true. Like before, in the case of a sentence with a constituent smaller than the proposition focused, we expect it to generate a set of alternatives in the typical fashion, as in (73).

(73) $[\![$Only **Erica** baked cookies.$]\!]^{f} = \left\{ \begin{array}{l} \text{Erica baked cookies} \\ \text{Kaylin baked cookies} \\ \text{I baked cookies} \\ \text{Kevin baked cookies} \\ ... \end{array} \right\}$

In (73), *only* asserts that the first proposition in the given set (which is equivalent to p) is true, and none of the others are true. This is the typical use of *only*. Again, in the event of proposition level focus, if C were restricted to propositions that are "contextually relevant" without further defining what it means to be contextually relevant, we could expect a loose set of propositions like the example set contains in (74).

(74) Alex: I wanted to bake

Brady: Only the oven is broken.

$[\![$The oven is broken$]\!]^{f} = \left\{ \begin{array}{l} \text{The oven is broken} \\ \text{There is an oven in this apartment} \\ \text{Alex wants to bake} \\ ... \end{array} \right\}$

This example set of propositions in (74) are all relevant in some undefined way to the given context, but a set of propositions like this would make *only* essentially necessarily false. There set must be further restricted, and applying the hypothesized restriction in (71) to the basic denotation of *only* in (72) creates the right predictions. This gives us the kind of set I have determined we need,

repeated in (75), where each proposition listed, when negated, asserts something that addresses how to realize the goal of baking.

(75)   I wanted to bake, only I didn't have any flour.

$$\left\{ \begin{array}{l} \text{T- I have no flour} \\ \text{F- I have no mixer} \\ \text{F- I have no oven} \end{array} \right\}$$

Once we have this set in (75), *only* asserts the truth values marked next to each proposition. The proposition equivalent to *p* is true, and the rest are false. This matches intuitions for concessive *only* by asserting that the only thing stopping the established goal of baking is the lack of flour, not the other potential issues listed. At this point the analysis works well, and supports the overarching analysis for discourse addition and focus in this chapter.

However, to add a complexity, let's look critically at the given truth values for the propositions in the set in (75). Strictly speaking, *only* is not wholly asserting that the non-*p* propositions are false. Rather, their being false is implicature, and cancelable, as (76) shows below.

(76)   I wanted to bake, only I didn't have any flour. In fact, I don't even have a working oven!

$$\left\{ \begin{array}{l} \text{T- I have no flour} \\ \text{F- I have no mixer} \\ \textbf{T- I have no oven} \end{array} \right\}$$

In (76), one of the propositions that was previously marked false is now true, and this is perfectly acceptable. The felicity of (76) tells us that *only* cannot be asserting that these other propositions in the example set are necessarily false. Rather, there is an implicature that *p* is actually the only thing blocking this goal from being realized. The usual use of *only* does not imply the falsity of the other propositions but rather it asserts them. In (77), I give an example with *only* interacting with a smaller focused constituent, and an unsuccessful attempt to cancel the implicature.

(77)   Only **Erica** baked cookies. #In fact, Kaylin baked cookies too!

$$\left\{\begin{array}{l} \text{T- Erica baked cookies} \\ \textbf{T- Kaylin baked cookies} \\ \text{F- I baked cookies} \\ \text{F- Kevin baked cookies} \end{array}\right\}$$

The second sentence could not successfully cancel *only*'s assertion that *p* is the only true proposition in *C* and give the truth values in the set above. Therefore in uses of *only* with smaller constituents focused such as (77), *only* must be assserting that the non-*p* propositions are false, and not implying them. This implicature as opposed to assertion could be seen as a difference between concessive *only* and "standard" *only*, which is contrary to the unification approach I am taking in this analysis. Furthermore it is an odd sort of implicature. It is not scalar, so the implicature could not be arising from the existence of a stronger item on the scale. It is not due to competition with some other lexical item that makes a stronger claim (as far as I can tell). Instead, I argue that this implicature held by *only* only when it has proposition level focus can be explained as resulting from the nature of the notion of relevance in the discourse restriction. As a reminder, in the current hypothesis the discourse restriction is the set of propositions that are relevant to the goal, negated, as was formally defined in (71). This is not a set of propositions that is explicitly clear in the discourse in the same way that something like a speaker's DC is. Things are entered into a speaker's DC when a speaker utters them, so it is totally clear what propositions would be there. In comparison, it is up to the interlocutors to themselves determine individually what would block/enable the given goal. For example, the speaker might not consider *I have an mixer* to be an issue worth considering when they consider baking because they like mixing by hand, so they don't need to bother negating it. Therefore these other propositions are negated *if* they are in the alternative set *C*, but we can't know for certain what propositions *are* in *C*, so we don't know for certain what propositions are negated. The result is a type of implicature in that we can make inferences based on what is likely to be in *C*, but we can explicitly exclude something from *C* to cancel that, as in (76). This predicts that we can test this by (slightly unrealistically) explicitly listing what propositions need to be in *C*, which is the scenario I attempted to build below.

(78) Alex: If you want to bake, I think you need a working oven, a mixer, and flour.

Brady: I agree.

Alex: And I want to bake. Only I don't have flour! ?In fact, I don't even have a working oven!

$$\left\{ \begin{array}{l} \text{T- I have no oven} \\ \text{F- I have no mixer} \\ \textbf{T- I have no flour} \end{array} \right\}$$

In (78), both interlocutors have explicitly agreed upon what propositions enable the baking goal, which is how we've defined the set of relevant$_g$ propositions. If the hypothesis is correct that these propositions negated are the ones that then fill out C, then *only* should now assert that they are false, rather than imply that they are false by our assumptions of whether they're in C or not. Which means that the scenario above would result in a contradiction. But it is not clear that the scenario is more than odd; nothing seems totally contradictory. However, to make the oddness clearer, contrast (78) with the version below, where *only* is replaced by *but*.

(79) Alex: If you want to bake, I think you need a working oven, a mixer, and flour.

Brady: I agree.

Alex: And I want to bake. But I don't have flour! In fact, I don't even have a working oven!

With *but* replacing *only* in (79), the scenario is no longer odd at all, showing a clear contrast between *only* and *but* here. Perhaps "propositions that address how to realize the goal, negated" isn't the best characterization of how the discourse molds C, as the result wasn't a clear contradiction or ungrammaticality in this scenario, but this characterization does seem to be at least on the right page, given that some oddness resulted for *only* and not *but*. At this point it makes sense to return to the discourse restriction I have hypothesized. One issue that I previously mentioned (and tabled for a few pages) was that this restriction seems somewhat stipulative. The analysis works and lines up reasonably well with the intuitions for what concessive *only* is doing. Is this an indication that the theory is wrong? Just because something *can* be stipulated does not mean it *should* be. To

consider all of the options, here I instead think about what it would mean to just take the set of relevant propositions instead of them negated, and then ask what the predictions are. This version of the hypothesis is the restriction in (80).

(80) **Discourse restriction for *only* v2**: $C \subset \{p | \text{RELEVANT}_g(\text{ASSERT}(p))\}$

This takes out the negation in the restriction, and gives us only the propositions that are relevant$_g$ to the given goal. While a reasonable step, this immediately hits a technical stumbling block. Consider the following example set of relevant propositions.

(81) I wanted to bake, only I didn't have any flour.
$$\left\{ \begin{array}{l} \text{I have flour} \\ \text{I have a mixer} \\ \text{I have an oven} \end{array} \right\}$$

The set in (81) cannot be the relevant *C*, unless we remove some of the constraints Rooth (1992) proposed. Specifically, *C* must contain the ordinary semantic value of the focused phrase, in addition to at least one other distinct element. In this case above, the focused element is the proposition *I didn't have any flour*, which is not an element of the given set, and not a proposition that is relevant$_g$ to the given goal of baking. This second hypothesized restriction will not work.

The strength of the first hypothesis is that it allows for the same denotation for all uses of *only*. This supports the overarching hypothesis that propositions are constituents that can be focused, FSPs can interact with proposition level focus, and that when they do we have seen issues with the typical FSP analysis that makes it clear that an additional restriction based on elements in the discourse must be in play. When we looked at discourse addition, reframing "contextual restriction" to be clearly defined via objects in the discourse was clearly needed because otherwise focus was uninformative. But when this analysis was extended to concessive *only*, the problem that would have arisen with an unrestricted *C* would have been the impossibility of *only*'s truth conditions, which is slightly different from uninformativity. The weakness of this analysis, however, is that the discourse restriction for concessive *only* is somewhat stipulative, although still doable with a

Table model of discourse in which we have imported goals and the notion of relevance from a conversational scoreboard model of discourse. The concessive flavor of concessive *only* comes from this discourse restriction, as this is where the negation is buried. A modified hypothesis that takes the negation out of the hypothesis fails to produce a viable *C*. In an effort to better explain the concessive flavor, I will introduce a new notion in the following section, but it is worth pointing out that a plus of this section's analysis is that it only requires adding goals to the model of the discourse that we are using, and goals have been independently argued for in different discourse models. Before moving on to the next hypothesis, I want to point out one more argument for trying a new hypothesis, in the shape of data that does not pose a problem for this section's analysis so much as it does not fit comfortably within it. This is the data where *only* appears with sentences without overt negation, as in (82).

(82)   I want to go the party, only I'm busy then.

The lack of negation is not necessarily a huge issue for the standing first hypothesis. I could propose that *busy* is roughly equivalent to *not free*, meaning that if *I am free then* is relevant$_g$ to the party-going goal, then *I am busy then* could be construed as the negation of that sentence. It could be the case that *busy* could be decomposed into *not free* in its lexical semantics. However, it still makes me uneasy with these analyses referencing $\neg p$ with propositions that do not involve overt negation. In order to both better deal with propositions lacking overt negation and take the issue of "where is the negation stipulated" out of the solution, I will propose a third hypothesis for this analysis, which better fits the data via introducing the notion of impediments.

3.5.2.2   Introducing impediments

The third hypothesis continues to work with domain goals, but it involves proposing a new notion and corresponding function instead of relying only on things that have been proposed in the previous work. Rather than stipulating negation in either the restriction or in the assertion of *only*, I would like to take seriously the intuition that concessive *only* flags the only thing that blocks the goal, or

that it flags the sole impediment to the goal. Instead of *C* being the set of propositions that, when negated, are relevant$_g$ to the goal, I propose the following notion of something being an impediment to the goal instead.

(83)   **Impediments**: The things that block a goal *g* from being realized.

This is not intended to be an object in the discourse along the same lines as goals are, but rather this is a notion that interlocutors can apply to their conversational scoreboard in order to guide their conversations, much like the notion of relevance. In terms of real world things that speakers must track, this makes as much sense as speakers keeping track of what enables their goal realization, and once you have a notion like this, you can define a corresponding function. In terms of linguistic data supporting the hypothesis that this is a function that speakers can access, I will step through the *only* analysis, and then discuss some follow up data with *but* indicating that it is not just an analysis of *only* that would benefit from introducing this notion. In this analysis of concessive *only*, however, the proposal is that *C* is restricted to the set of propositions that constitute impediments to the goal. This is the following restriction.

(84)   **Discourse restriction for *only* v3**: $C \subset \{p | \text{IMPEDIMENT}_g(p)\}$

The restriction in (84) is built to work with a standard denotation for *only* again, returning to assuming the denotation given earlier in (72). So this version of the analysis regains that element of parsimony of using only one denotation of *only*, and it is totally compatible with the overarching hypothesis of a FSP interacting with proposition level focus which in turn illuminates extra discourse restrictions attached to the FSPs. However, here no extra negations are needed, and *C* has a simple restriction where only one function, which relies on only one object in the discourse, is applied to determine what propositions qualify. This also makes it easy to deal with uses of *only* without an overt negation, such as the example repeated in (85). With this restriction, we expect possible members in *C* like the ones in the set in the following example, where the relevant goal is underlined.

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(85) I want to go to the party$_g$, only I'm busy then.

$$\left\{ \begin{array}{l} \text{I am busy then} \\ \text{I have a feud with the host} \\ \text{I have no transportation there} \end{array} \right\}$$

The potential impediments in (85) mostly lack overt negation, but they are all valid impediments to the given goal of going to the party. Multiple interlocutors may not necessarily be in agreement on what is an impediment$_g$, much like how interlocutors may not agree on what is relevant$_g$. I previously discussed how this lack of certain agreement creates the effect that the falseness of the non-p propositions in the set is only implied by *only* instead of asserted, because interlocutors cannot assume that any particular proposition is in C for everyone. This same explanation extends to impediments, and works identically with this hypothesis. Interlocutors may have a different idea of what constitutes an impediment to a given goal, and unless they have explicitly discussed and agreed upon what constitutes the impediments to a specific goal g, they can only assume what the other speaker has in mind. Consider the following discourse, where I have attempted to make this set of impediments$_g$ explicit in order to test whether this implicature persists or whether the falseness of the other propositions is now more clearly asserted.

(86) Alex: If you want to bake, I think the things that would stop you would be if you had no working oven, no mixer, or no flour.

Brady: I agree. I cannot see any other impediments to baking.

Alex: I agree. And I want to bake! #Only I can't find a bowl!

Brady: We literally just agreed that this would not stop you from baking.

In (86), the two interlocutors agree upon an explicit set of impediments, and they agree that it is limited to these things. As long as the interlocutors stick to this set (shown above by Brady agreeing to include nothing else in the set of impediments), concessive *only* is odd with a proposition that is not in the explicitly listed set of impediments. In fact, as the final line of the example shows, an interlocutor can explicitly object to what about the use of *only* was infelicitous here. This scenario

supports an analysis of *only* as flagging the only member of the set of impediments to this goal that is true.

To further support proposing a notion of impediments, I would also like to step away from FSPs and talk about some data involving *but*. Proposing a new notion of impediments deals well with this phenomenon of concessive *only*, but I expect it can shed light on other phenomena as well. Grice (1981) suggested that *but* could be analyzed as conjunction, but with the implicature that the second proposition is somehow contradictory to the first. It is not the case that *but* only conjoins things that are full on contradictions, but it can be difficult to characterize exactly what is the link. I propose that one way to think of it involves impediments. In (87), I substituted *but* in for *only* from the previous example.

(87)   Alex: If you want to bake, I think the things that would stop you would be if you had no working oven, no mixer, or no flour.

Brady: I agree. I cannot see any other impediments to baking.

Alex: I agree. And I want to bake! #But I can't find a bowl!

Brady: We literally just agreed that this would not stop you from baking.

In (87), *but* is as unacceptable as *only* was in (86), and the same objection about its infelicity can be made. One way to explain this data would be to assume that *but*'s assertion is effectively conjunction, but it also has the presupposition that the second proposition is in the set of impediments to the given goal. The goal does not necessarily have to be in the first proposition it conjoins, but rather *but*, like *only*, seems to be sensitive to a goal nearby. Consider the following example, where the goal is underlined again.

(88)   I said I would hang out with you when I finish packing$_g$. I have finished packing, but I am too tired (to hang out with you) now.

The example in (88) shows that the proposition immediately before *but*, the first one conjoined, does not have to set the goal, as the goal here is not finishing packing. Being too tired is an

impediment to the speaker hanging out with their friend. So it looks like an analysis of *but* requires simply that the second proposition be an impediment to the local goal.

When talking about discourse *also*, the restriction limiting *C* to propositions in the QUD and the PS made sense in the context of adding to a list of answers to a question in the discourse. Looking at the restriction for concessive *only*, the third option for an analysis makes the best sense: *C* for *only* is restricted to the set of impediments to the goal in the discourse and then the assertion highlights the exception. While the other analytical options listed also technically worked fairly well, this option is clear about where the concessive flavor comes from without having to stipulate where any negation(s) are. Proposing a notion of impediments to discourse goals is less parsimonious, but it also promises to come in handy with other analyses, such as for *but*. In addition to a simple discourse restriction, the same denotation works for all uses of *only*, which is in support of the overarching hypothesis about proposition level focus. In the case of discourse *also* and other cases of discourse addition, proposition level focus meant that the presupposition of *also* was totally uninformative if we were not clear about what it means for *C* to be "contextually restricted". In the case of concessive *only*, an unrestricted *C* for proposition level focus results in an assertion that effectively cannot be true. The next question is whether we see this same restriction active in uses of *only* where smaller constituents are focused, because that would tell us if this restriction could be lexically encoded, as I proposed for discourse *also*.

One immediate difference occurs when looking at data with smaller constituents focused, and that has to do with responding to questions. Concessive *only* cannot follow a question, but *only* with a smaller constituent focused can.

(89)   Alex: Did you buy everything you needed?

       Brady: I only bought **paper**. (The store was out of pens.)

In (89), *only* interacts with the focused phrase *paper*, and is perfectly felicitous in response to a question. This is not totally predicted by extending the analysis of concessive *only* to "typical" uses of *only* like this. However, we can still investigate whether the same restriction is in play, overarchingly matching the pattern from discourse *also*. In examples like (89), it is very difficult to

tell what the goal is. So consider an example like the following, where the goal is explicitly stated as it was in the examples with concessive *only*.

(90)   Alex: I want to throw a really fun party this weekend$_g$.

Brady: Only **Erica** would be able to make it. Maybe you should wait until the following weekend, when more people can make it.

In (90), there is a clear goal stated and underlined for clarity, followed by a use of *only* interacting with a focused individual *Erica*. The previously discussed restriction for *C* for *only* is that it is limited to propositions that are impediments to the goal. Here, because *Erica* is focused, the focus semantic value is also limited to propositions of the form of *x would be able to make it*, where *x* is a variable for individuals, so this restriction would apply to a set of propositions that is already much more limited than proposition level focus creates. To step through this clearly, below I present a hypothetical focus semantic value (before any discourse restriction applies) and then talk through a hypothetical context for it.

(91)   Only **Erica** would be able to make it.

$$\left\{ \begin{array}{l} \text{Erica would be able to make it, Kaylin would be able to make it.} \\ \text{Rowan would be able to make it, Emily would be able to make it.} \\ \text{Brad would be able to make it, Colton would be able to make it.} \end{array} \right\}$$

These propositions in (91) are all of the correct shape as to be included in the focus semantic value for this sentence. In this hypothetical scenario, Erica, Kaylin, Rowan, and Emily are some of the party planner's favorite people. Not having them there would make having a really good party more difficult, at least for the speaker. In contrast, while both Brad and Colton frequently appear at parties in this crowd, they are jerks, and you honestly would not want them at your party. Them coming would be more of an impediment to a good party than them not being able to make it. For the sake of a minimal example, these are the only party-going individuals we will consider for this example. With this information in mind, we can compare the truth values of saying *only **Erica** would be able to make it* in two different scenarios: one where Erica is literally the only person in

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this set of six who would be able to make the party, and one where Erica can make the party but so can Brad and Colton. If *C* is restricted to propositions that constitute impediments to the goal of throwing a really fun party, then it should not matter whether or not Brad and Colton can make it, just whether the other people can. So in that case, we predict that in both scenarios *only p* should be true. If *C* is not restricted to propositions that constitute impediments to this goal, then *only p* should only be true when Erica is the sole person in this list of six who can make it, and false when Brad and Colton can also make it. The former prediction is borne out, not the latter, which is illustrated with the truth values in (92) below.

(92) Only **Erica** would be able to make it.

$$\left\{ \begin{array}{l} \textbf{T-}\ \text{Erica would be able to make it, } \textbf{F-}\ \text{Kaylin would be able to make it.} \\ \textbf{F-}\ \text{Rowan would be able to make it, } \textbf{F-}\ \text{Emily would be able to make it.} \\ \textbf{T-}\ \text{Brad would be able to make it, } \textbf{T-}\ \text{Colton would be able to make it.} \end{array} \right\}$$

The truth values of the critical condition are shown in (92), where the bad party-goers can make the party in addition to Erica. In this scenario, in response to a clear goal of having a really fun party, it is perfectly acceptable to say *only **Erica** would be able to make it*, meaning that *C* has to be restricted to not include the two propositions that do not constitute impediments to this goal. This example is in support of an analysis where the discourse restriction of concessive *only* applying to uses of *only* with smaller constituents focused as well. This analysis in turn adds strength to the pattern I propose for *also* and other expressions of discourse addition, where the discourse addition use results from proposition level focus and reveals a restriction on *C* that can then be seen to be present in uses with smaller constituents focused as well. This allows me to propose that, like for discourse addition, the restriction for *only* is lexically encoded, applying to all uses of *only*, not just the ones with proposition level focus.

(93) $[\![\text{only}]\!] = \lambda p \forall q : q \in C \wedge q \neq p[p \wedge \neg q]$

Where $C \subset \{r | \text{IMPEDIMENT}_g(r)\}$

The denotation for *only* in (93) lexically encodes how *C* is contextually restricted, using the discourse and knowledge of the goals in it. For this denotation the same question emerges of

whether to replace the *C* in the first line with effectively the second line. Given that I discussed the pros and cons of either of these equivalent notations in the analysis of discourse addition already, I will not rehash it here, but just mention that this analysis could also be represented in either way.

It is worth pointing out that the case for lexically encoding this restriction so that it limits all uses of *only* is murkier than the case for lexically encoding the restriction for discourse addition, however. None of this analysis predicts that *only* would be able to follow a question except when the focus alternatives are generated at the level of the proposition. This could be a sign that concessive *only* is somehow different from "typical" *only*, which would weaken the argument for unifying all uses of *only* with this denotation and restriction. In addition, some of those examples with *only* that follow questions make it hard to determine a goal, which in turn makes it hard to classify whether the *only* propositions are following a restriction that depends on knowing the goal. For a question like in (89), it is easy to hypothesize a goal that fits, but consider a question like the following one.

(94) Alex: Who all showed up for the party?

Brady: Only **Tommy** didn't show up.

In (94), Brady felicitously uses *only*, but there is no clearly defined goal, just a clearly defined QUD from Alex's question. We can accommodate some kind of goal for this conversation, or we can discuss the divide in types of goals that Roberts (2004) discusses. As a reminder, the type of goals that I have been talking about are what she calls "domain goals", which are things that interlocutors are committed to doing in the real world. She distinguishes discourse goals as a subset of domain goals, the ones that deal with goals dealing with the conversation, like answering a question. She equates discourse goals with QUDs. However, if a question denotes a discourse goal, which it would represent a subtype of domain goals, then there is no immediately apparent reason why something like concessive *only*, which is sensitive to a (domain) goal, would be unable to follow a question, as a subtype of domain goals. If we only theorize questions as adding a QUD to the Table, and not adding a goal to the conversational scoreboard, it is perfectly reasonable that something sensitive to a goal might not follow a question well. However, as Roberts points out, it is true that after a question, cooperative discourse addresses the question and attempts to answer it or

make clear that it unanswerable, which does seem like evidence that there may be something like a discourse goal as a high priority goal, but could just result from how a model of discourse like the Table model works. Minimally, questions do not seem to be patterning with clear goal-setting assertions. Outside of toy discourses built for clear examples in research, people deal well with answering implied questions, accommodating presupposition failure, and interpreting discourse that might not clearly follow Grice's Maxims, so it makes sense to assume that in situations like (94) interlocutors can accommodate some sort of goal.

I do not want to dismiss the problematic data by calling it too complicated and limiting my view only to the simpler data, but it is easier to build a model with the cleaner data to start and then expand it to the murky cases. More importantly, given that concessive *only* is relevant in that it supports the overarching analysis for discourse addition and not because it is the focus of this chapter, I do not want to linger here excessively in the details, though. So to conclude this analysis for the moment, the FSP *only* can be analyzed along the same lines as *also* was analyzed earlier in the chapter. The concessive case occurs when *only* interacts with proposition level focus, and the restriction that emerges limits *C* to propositions that are impediments to the goal. Looking at cases of *only* with lower focus, this restriction seems to be in play with some of them, but other cases may pose a problem for this analysis.

3.6   Interim conclusions

At this point we have two examples of classic focus sensitive particles with a reading that can be analyzed as proposition level focus. In each case, the use of this FSP with proposition level focus illuminates some discourse restriction limiting *C* that can be expressed using objects in the discourse. And in each case, that restriction is shown to extend to uses of that FSP with smaller constituents focused. This presents evidence in favor of being able to focus propositions as a whole, and builds a case in favor of the more precise idea of "contextually restricting *C*" using objects in the discourse itself. In the case of discourse addition, I first proposed an analysis for *also*, making a case for analyzing this as an effect of focus sensitivity. Then I extended it to the rest of the class

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of expressions that participate in discourse addition, in another argument for a cohesive analysis. For expressions with discourse addition as a whole, I proposed that the thing that this whole class of expressions has in common is focus sensitivity, and the same discourse restriction, which I am repeating here in (95).

(95) $C \subset (QUD \cap (CG \cup T))$

In terms of continuing the topic of "addition" in semantic computation from the previous chapter, discourse *also* represents discourse addition by means of adding another answer for an established QUD that already has an answer proposed. It does not strictly use addition in the same way that the comparative and event summing data did, in that are no numbers or plus signs involved. And analytically the link between the two is somewhat weak, due to the lack of a compositional route between the data in either chapter. Discourse *also* involves no degrees, and if we define "addition" for the moment as strictly one number plus another, this reading does not have it. However, looking beyond *also*, there still seem to be multiple morphological indications that these phenomena are related. This is not currently explained or predicted by the given analysis, but rather explaining this link remains as an avenue for future research. Ignoring this issue, the restriction in (95) intuitively explains why *also* and the other discourse addition expressions must "add to a list". Without precisely restricting C to items that are in the CG or on the Table and are also answers to the QUD, *also* is uninformative and it is not predicted that it must appear in list environments. With this restriction though, *also*'s presupposition requires that it follows a proposition that is an answer to the same QUD and is already in the CG or on the Table proposed to enter the CG. Thus this restriction naturally creates a list environment, *also* signals continuation of a list, and the effect of "adding to a list" is realized. This analysis made the immediate prediction that other focus sensitive expressions should be able to (a) interact with proposition level focus, and (b) have restrictions on C framed in terms of objects in the discourse. This prediction bears out, which I show with an analysis of concessive *only*.

In the case of concessive *only*, without precisely restricting C, *only* has truth conditions that are impossibly strict and will never result true. This supports the prediction that other FSPs can be

analyzed as involving a restriction on *C* that limits it using objects in the discourse. The fact that *only* uses a different restriction from the one that creates discourse addition also tells us that this restriction is lexically specified, and should be able to vary. The reoccurrence of the same restriction with lower focus also supports these restrictions being lexically stored, rather than attached to a principle of focus interpretation or anything like that. In addition to this support for the discourse addition analysis, the discussion of concessive *only* made a few contributions that are distinct. First I linked a Table model of discourse with a conversational scoreboard model of discourse in order to incorporate the idea of domain goals into this model with clearly defined categories for an interlocutor to access. While interlocutors tracking goals in the discourse allowed for a good fit for the data, I then proposed the notion of impediments in order to better fit the concessive *only* data. This does not require assuming more discrete objects for speaker to track in the discourse, but rather it proposes a notion and a corresponding function defining whether something is an impediment to a goal. This is an expansion of existing theories, but it promises to shed light on other phenomena. For starters, I discussed the beginnings of an analysis of English *but* that derives its implicature from the notion of impediments, but I expect this might be a useful tool in other analyses as well.

As it turns out, these two FSPs are certainly not the only examples of FSPs that interact with proposition level focus, and we will see more in the next chapter. But given that this is an interim conclusions section and a good place to speculate, a reasonable question to ask is should we be able to see proposition level focus without an FSP in the sentence? There's no reason why an FSP should be required in order to focus any particular constituent, and there is plenty of research on the role of focus in other situations, such as with question-answer congruence (Rooth, 1992, 1996). However, one of the barriers to proposing proposition level focus is that there are no clear phonetic cues for it. When a FSP is available, this could be thought of as a phonetic signal that there must be focus in this sentence, and if no smaller constituent is clearly prosodically marked, then the listener would consider whether the sentence as a whole is the focused constituent. If no overt word requires focus for interpretation in addition to no overt prosodic cues for focus, then the listener loses this cue that they should be looking for a focused constituent, and possibly considering focus

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at the level of the proposition.

In the next section, I will look at other avenues connecting this chapter and the one before it. Specifically, I will return to some topics from Chapter 2 by looking at data involving degree constructions, but I will end up proposing a focus-sensitive analysis instead of a degree semantic analysis.

CHAPTER 4

ASPECTUAL PARTICLES IN COMPARATIVES

4.1 Chapter goals

In this chapter I incorporate elements from the previous two chapters, examining the use of aspectual particles in comparatives. Chapter 2 builds event structures out of degree structures, and establishes this directional relationship. This opens up the question of if this is a unidirectional relationship, or whether there are event type structures that build into degree structures as well. On the surface, both aspectual particles appearing in comparatives, as in (1), and iteration in comparatives, as in (2), appear to demonstrate this kind of relationship.

(1) Andrew graded six papers. I graded **still** more.

(2) I graded **more and more**.

Both examples above appear to be comparatives, a prototypical degree structure. However, *still* and iteration typically give event time information, and appear in event semantics instead of degree semantics. So these two are immediate candidates for data that shows a directional relationship building a degree construction using event structures. In this chapter, I will provide an analysis for aspectual particles in comparatives, like in (1), but not for iteration in comparatives, like in (2). Instead, I will step through some of the data and analysis from Beck (2012) indicating that iteration in comparatives is patterning like pluractionality and should therefore be analyzed as an event construction instead of a degree construction. This is not counter to the directionality in Chapter 2. Then, taking the lead from that, I will show how aspectual particles in degree constructions should also be analyzed independently, not as an event construction contributing to a degree construction. I will propose that the aspectual particles are acting independently of the comparative, and they act similarly in non-degree constructions as well, and in doing so I will directly involve my analysis from Chapter 3. As a reminder, Chapter 3 proposed an analysis of discourse addition with focus sensitive

particles which proposes proposition level focus and formalizes what "contextual restriction" is. In my analysis of aspectual particles in comparatives, I rely on these tools of proposition level focus and using objects in the discourse to "contextually restrict" the focus semantic value, linking the two previous chapters.

The appearance of aspectual particles in comparatives has been observed in the past, and besides my own in Chapter 2, there is other research linking degrees and events or event time. Specifically, there is some research relating degrees to aspect. Kennedy & Levin (2008) relate degrees to aspect explicitly for degree achievement verbs, building on the link between adjectives like *wide* and verbs like *widen*. Additionally, Piñón (2008) creates a theory that builds aspect with degrees as a whole, which would support a unilateral relationship where *all* event structures have degree arguments, as opposed to event structures variably requiring, permitting, or disallowing degree arguments. Whether or not all event structures have degree arguments, this research also falls in line with the directionality I observed, where degree structures can build to or be contained in event structures. In this chapter, I focus on data that appears to present a counter-argument, data where aspect things seem to contribute to degree things instead of the opposite. I first step through some of the data and analysis from Beck (2012) indicating that iterations in comparatives should be analyzed as event structures instead of degree structures. Then, I tackle the appearance of aspectual particles in comparatives, utilizing tools from Chapter 3 to show that this data can also be analyzed in a way that does not support a counter argument to the directionality so far observed.

4.2 Iteration in comparatives

Iteration in English is often aspectual event repetition. However, a similar looking phenomenon appears in comparatives, making it data that immediately pops up if you propose that there is a directional relationship between degree constructions and event constructions. Consider the following data.

(3) I **ate and ate**.

(4) I ate **more and more**.

(5) They are **taller and taller** every time I see them.

In (3) we see a prototypical example of aspectual iteration, indicating that the eating event continued for some time. A minimal pair appears in (4), where *more* is repeated instead of the verb itself. As has been indicated about the direction of this analysis, this sentence indicates that the eating event continued for some time, and there does not seem to be a typical comparative reading allowed. Finally, the third example in (5) iterates the adjective, necessarily including the comparative *-er* affix. A comparative reading of sorts is allowed in these cases. Looking at (4), this could be paraphrased as someone eating more on one eating occasion than they did on the last, and in (5), this could be paraphrased as someone is taller in each occasion than they were at the last. However, these paraphrases in turn convey iteration and possibly an implied growing event, which is emphasized by a modifier involving "every time".

Beck (2012) calls this iteration in comparatives construction pluractional comparatives, and provides an analysis that successfully parallels their analysis for verbal pluractionality. I do not intend to show their whole analysis here, as I will not be building from it in the following section, but I will show their tests showing that this is not acting like a degree construction, but rather an event construction. Consider the following examples, where I added the (a) line for clarity here, but the rest is from Beck (2012).

(6) a.   Otto ran faster than John.

b.   Otto ran faster and faster.

c.   * Otto ran faster and faster than John.

(7) a.   Otto ran three seconds faster.

b.   * Otto ran three seconds faster and faster.

c.   * Otto ran much faster and faster.

In (6), the first line shows a typical comparative which includes a standard degree in a *than*-phrase, and the second shows iteration in a comparative. In (6c) we see that what looked like a comparative can no longer take a *than*-phrase argument, which the typical comparative without

the iteration is able to do. In (7), the first line again shows a typical comparative, this time with a differential degree, as is typically allowed in comparatives. In the following two lines, we also see that for the iterative version, a differential is blocked as well, both with a measure phrase and with *much*. Again, this is allowed in a typical comparative, so above we see two arguments that the iterative version is not patterning like a comparative. In addition to this data, Beck shows data that orients pluractional comparatives toward an event analysis, showing that they work better with event modifiers. Consider the following data.

(8) Between 2:30 and 6 pm, the talks got better and better.

(9) My crab apple tree grew taller and taller every year.

The prepositional phrase in (8) gives a beginning and end time, which fits with bounding an event, not with a degree construction. If we interpret adjectives as having state arguments, this still is not consistent with an adjectival interpretation, as states are often argued to not have time arguments in the same way that events do (Parsons, 1990). Then in (9), we see an explicit quantifier for a growing event, fitting in very well with a pluractionality analysis where an event of sorts is repeated, which is the analysis Beck (2012) pursues.

Here I have presented starting data that on the surface appears to look like aspectual things building degree constructions. I have also presented the arguments that Beck (2012) proposes for why this is not the case. Pluractional comparatives can be analyzed as eventive pluractional constructions and do not behave like comparatives. I am not repeating all of Beck's analysis here, as I will go in a different direction in my analysis of aspectual particles in comparatives, using my analysis from the previous chapter instead of pluractionality. However, the important contribution to note here is this strategy of tests showing that the construction is behaving differently from how it initially presents. In the following section I will present tests, building on work done by Ippolito (2007), showing that aspectual particles in comparatives are behaving like focus sensitive particles instead of aspectual particles.

4.3   Aspectual particles in comparatives

The direction so far observed is that some words and constructions that are typically associated with degrees. For example, the comparative and the whole class or additive expressions can reliably acquire an event interpretation, and the data showed by Thomas (2017) indicates that this is a directional pattern that occurs cross linguistically. While this so far supports a directional hypothesis, but so far the reverse direction has not been investigated and a handful of data on the surface appears to support the opposite direction, event constructions composing degree constructions. However, returning to the data previewed at the end of Chapter 2 and repeated below, we can see a trend of aspectual particles surfacing in comparatives, where the overall construction retains a degree-comparative meaning. This raises the question of whether this is an instance of the reverse direction, event constructions compositionally being built into degree constructions, or does this data present something else.

(10)   Andrew graded six papers. I graded **still** more.

(11)   Andrew graded six papers. I graded **yet** more.

(12)   Andrew is pretty tall, at 6'1". At 6'3", I am **still** taller.

(13)   Berta ist **noch** größer als   Adam. (Umbach, 2012)
       Berta is **still**   taller   than Adam
       'Berta is even taller than Adam.'

As was previewed before, the data in (10-12) show particles like *still* and *yet*, which are typically well known for aspectual uses, appearing in a comparative. As we can see in Umbach's German data in (13), this appears to be a cross-linguistic phenomenon as well. This data initially appears to support an analysis where event denotations can compositionally construct degree meanings in that the whole of the construction is a degree expression, but in this particular data, the aspectual particle appears to contribute something extra on top of the comparative reading. If it were removed, then the sentence would be a typical comparative, so it can't be that the aspectual particle itself is the thing constructing the comparative. Instead, as per the translation from Umbach (2012), the

aspectual particle appears to contribute a sort of *even* reading, making a clear link to the focus sensitivity topic of the previous chapter.

4.3.1 A summary of *still* from Ippolito (2007)

Here I review Ippolito's (2007) analysis of various uses of *still*. They also include data for aspectual particles that don't appear in comparatives, which I review briefly for the sake of their argument, but not extensively. They describe multiple uses of *still*, not all of which are crucial to the analysis of aspectual particles in comparatives, but all of which I review here for completeness.

4.3.1.1 An overview of the uses of *still*

To focus on *still*, Ippolito (2007) breaks its uses into multiple types: aspectual, marginality, concessive, and exclusive. The first use, ASPECTUAL, is what most people probably think of as the typical use of *still*, the one that appears when discussing event time. *Already* has a similar use.

(14)   John is **still** cooking.

(15)   Got an A! I was jumping for joy (internally, keep in mind it's **still** 8am).

(16)   John is **already** cooking.

(17)   It's **already** 5 o'clock.

The above examples show that the aspectual use of *still* is event continuation. In (14), it says that the event is continuing. In (15), this use still appears to deal with event time, but note the implication that this is earlier than expected. Ippolito indicates that not all English speakers accept this use, and for the speakers that do, this use appears temporal, but should probably be reclassified as the EXCLUSIVE *still*. The aspectual use of *already*, as in (16), also flags that an event is ongoing, but with the implication that it is an early time for the event. Ippolito highlights the subtle difference that in (17), we see that the implication is similar to that of (15), but opposed in that *still* in (15) implies that we are at this time of day later than expected and *already* in (17) implies that we are at

this time of day earlier than expected. However, subtleties aside, both of these have the aspectual use of dealing with event time.

The second use of *still* and *already* here are no longer in the domain of event time, but rather they appear with gradable predicates. These, Ippolito calls MARGINALITY *still* and *already*. The following examples assume a context where we are talking about how safe various types of cars are, and possibly ranking them on a scale of car-safety.

(18)   Compact cars are **still** safe; subcompacts start to get dangerous.

(19)   (Compact cars are still safe.) Subcompacts are **already** dangerous.

In (18) and (19), there is no event time information given, even though words like *start* or *begin* appear in addition to these aspectual particles. Instead, these uses of *still* and *already* indicate where something is on the scale of a gradable adjective. Some analogy can be made to the aspectual use if we imagine for a moment that the scale is a physical path that we are treading. The context of discussing the scale and ordering the cars is metaphorically the event of traveling from one end of the scale to the other. In this metaphor, *still* and *already* make sense as they refer to either the continuation of being in the "safe" part of the scale or edging into the "dangerous" part of the scale. Leaving the metaphor behind, the marginality uses of these aspectual particles are not strictly temporal, and so Ippolito analyzes them as different. Another way of thinking about what *still* and *already* are doing here is that they are flagging that this adjective holds of this thing, but barely. So for (18), compact cars have a greater degree of safety than the amount to count as safe, but not by a large amount, just by a marginal amount.

The use of *still* that I will argue is the most relevant is the one Ippolito calls CONCESSIVE *still*. This is exemplified in the following examples.

(20)   (Even) if the doctor tells him not to, Harry will **still** run the marathon.

(21)   John studied all night. He **still** failed the test, though.

In (20) and (21), these uses of *still* do not contribute meaning about the aspect of an event, nor do they make a point about a gradable predicate. Instead, there *still* contributes meaning similar

to *even* or *even so*, and impressionistically it highlights the (un)likelihood of something happening given the circumstances. This is very similar to how *still* works in comparatives, and I will end up arguing that these are in fact the same kind of use of *still*.

Ippolito notes in a footnote that *still* can also appear in a comparative, but despite appearing with a clear gradable adjective, this is not a marginality use. This is what I am overarchingly interested in here, but in their paper they give the following data to illustrate this kind of use.

(22)   A **still** greater offer came from the Dean.

In (22), there is a clear scale, but marginality *still* flagged that the subject is within the bounds of things that count as this adjective, or achieves a degree slightly greater than POS for that scale, and this is not communicated in (22). This offer might be well above POS, or it even might be below it, as long as it is greater than whatever offer was mentioned earlier in the (assumed) conversation. In this chapter, I propose that a better comparison for this use of *still* is the concessive still. In the following sections, I preview the analysis of various *still*s from Ippolito (2007) and attempt to determine whether the concessive use is the right analysis for cases like (22) where *still* appears in a comparative. Then, I will extend that analysis.

4.3.1.2   Ippolito's analysis

Ippolito (2007) analyzes each of these uses as different, but hypothesizes that *still* and *already* have the unifying factor of associating with focus. While each of the uses are focus sensitive, they interact with the focus semantic value differently. Focus-sensitive particles are broken up into additive particles like *also*, scalar particles like *even*, and exclusive articles like *only*. We've talked about focus reasonably extensively in the previous chapter, but given that I am reviewing Ippolito's analysis, we'll touch on how they model FSPs. Ippolito glosses each of these classes of FSPs as follows, where the underlined part is presuppositional.

(23)   a.   [ADD$_1$ [...F$_1$...]]: [...F...]

$\underline{\exists F' \neq F[...F'...]}$

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b. [SCAL₁ [...F₁...]]: [...F...]

$$\frac{\neg\exists F' \neq F[[...F...] <_{likely} [...F'...]]}{}$$

c. [EXCL₁ [...F₁...]]: $\neg\exists F' \neq F[...F'...]$

[...F...]

In words, an additive focus sensitive particle associating with the focused element F asserts only the truth conditions of F, truth conditionally, but it has the presupposition that there is some other F' that holds as well. As a reminder, this is like *also*, which Chapter 3 discusses more thoroughly, but which can be summarized as asserting p while presupposing q from p's focus set. A scalar focus particle also contributes only the truth conditions of F truth conditionally, but the presupposition is that F is the least likely of the relevant alternatives. This is like *even*, which does essentially assert p while presupposing that p is less likely than the other propositions in its focus set. An exclusive focus particle presupposes F, but truth conditionally asserts that no other options F' hold. This is exactly what the FSP *only* does, assert that p is true and no other p from its focus set is true. The analysis provided by Ippolito (2007) is that aspectual and marginality *still* are additive particles, concessive *still* is a scalar particle, and for the dialects that have an exclusive *still* it is an exclusive particle.

Ippolito (2007) gives aspectual/temporal *still* the following denotation:

(24)   John is still cooking.

(25) $[\![\text{still}]\!] = \lambda t \in D_i.\lambda e \in D_l.\lambda P \in D_{\langle l,\langle it \rangle\rangle} : \exists t[P(e)(t') = 1].P(e)(t) = 1$

The denotation mirrors that of an additive particle from (23), in that what is actually contributed is the temporal ordering saying that this event has occurred before. The temporal ordering (this event has held previously) is reversed for a version of aspectual *already*. This use of *still* seems clearly distinct from the use in a comparative, so I will not discuss it further here.

Marginality *still* is also an additive particle, in this case one built to interact with a gradable predicate, as Ippolito assigns it a wholly distinct denotation. As a result, Ippolito's denotation

parallels the previous one in terms of the distribution of presupposition and truth condition, but differs in terms of working with the gradable predicate instead of event time.

(26)   Compact cars are still safe.

(27) $[\![\text{still}]\!] = \lambda x.\lambda P_{\langle d,\langle et\rangle\rangle} : \exists y \neq x[\exists d[C(d) \wedge P(y) \geq d]].\exists d[D(d) \wedge P(x) \geq d]$

Here, *still* is designed to work with with something like *safe*, of the type Ippolito assigns to gradable adjectives instead of propositions. However, the design is immediately reminiscent of aspectual *still* in terms of presupposition and truth conditions. A parallel use of *already* is also provided in their paper, again with minor ordering tweaks.

While marginality *still* works with a gradability and a scale, Ippolito voices the intuition that this is not the *still* that appears in comparatives. The *still* in comparatives gives an emphatic *even so* reading, suggesting a scalar particle rather than an additive particle. Given that I share this intuition, I will move on from this use of *still* to Ippolito's analysis of the relevant scalar use.

Finally, concessive *still* is defined as a scalar particle, reflecting its similarity to *even* instead of an additive particle like *too*. Ippolito gives the following definition in (29), where I have added a gloss of the denotation in prose in the (b) line for readability. For this denotation, Ippolito makes the following syntactic assumptions in (30).
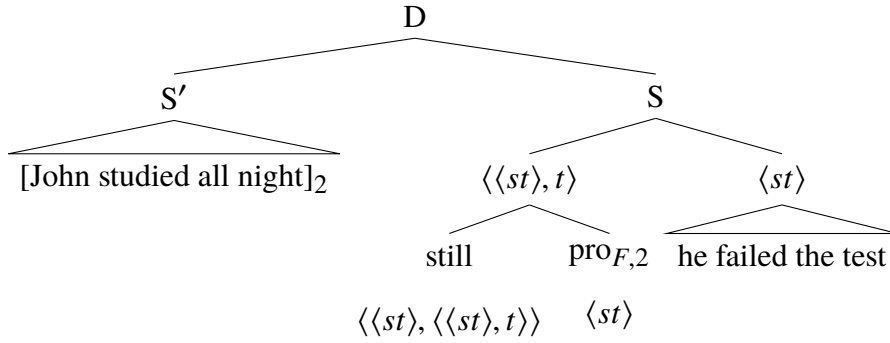
(28)   John studied all night, but he still failed the test.

(29) $[\![\text{still}]\!] = \lambda p_{\langle st\rangle}.\lambda q_{\langle st\rangle} : max_{\leq,w_C}\{w : w \in p \wedge w \in q\} <_{likely} max_{\leq,w_C}\{w' : w' \in \neg p \wedge w' \in q\}.q(w) = 1$

   a. For any proposition p, any similarity relation $\leq$, and any world w : $max_{\leq,w_C}(p) = \{w' : p(w') = 1 \& \forall w'' : p(w'') = 1 \rightarrow w' \leq_w w''\}$

   b. Given proposition p and proposition q, the set of worlds (that are maximally similar to the actual world) in which both are true are less likely than the the (maximally similar to the actual world) set of worlds in which p is false and q is true.

(30)

```
                                 D
                ┌────────────────┴────────────────┐
               S′                                  S
        ┌───────┴───────┐              ┌───────────┴───────────┐
 [John studied all night]₂        ⟨⟨st⟩, t⟩                  ⟨st⟩
                                ┌──────┴──────┐          ┌──────┴──────┐
                              still        pro_{F,2}   he failed the test
                       ⟨⟨st⟩, ⟨⟨st⟩, t⟩⟩      ⟨st⟩
```

This denotation makes *still* a scalar particle like *even*, using the same likeliness scale that *even* uses. There is no temporality or scale from a gradable adjective needed, but rather there is an intensional ordering involved, where sets of worlds maximally similar to the actual world are ordered by likeliness for the relevant scale. Here, *still* obtains a high scope where it manages to interact with two propositions by joining with a pro coindexed with the previous sentence (*John studied all night*), and then with the next sentence (*he failed the test*). The given syntax shows parallels with the structures Ippolito assigns for their analysis of the other uses of *still*, in terms of *still* interacting with a covert variable, bound by something higher, and focused. While focusing something silent still seems odd, and at least in terms of prosodic implementation, impossible, Ippolito cites the argument from Heim (1992) which I reviewed in Section 3.4 in favor of being able to focus a silent element. It's worth noting that their analysis does not reference alternatives in the same way that Rooth does. Rooth assumes the prosodic focus itself generates sets of alternatives and then the FSP can refer to $[\![\alpha]\!]^o$ and $[\![\alpha]\!]^f$ both in its denotation, but instead Ippolito works in an intensional semantics where *still* simply refers to sets of worlds in a built in sort of way. Ippolito does not then reference $[\![\alpha]\!]^f$ or C. This is a methodological note though, not an incompatibility of analyses note.

To plug the example of concessive *still* from (28) in to this denotation and structure, we get that *John studied all night* is proposition p and *he failed the test* is proposition q. Although the presupposition should vanish from the computation once it is checked, I have for clarity included it underlined in the first line in (31) to show what requirement it is that has already been checked,

rather than including a step by step computation of the whole. Then the whole thing is paraphrased in prose after.

(31) $[\![\text{still}]\!]([\![\text{J-study}]\!])([\![\text{J-fail}]\!]) = \underline{max_{\leq,w_C}\{w : w \in [\![\text{J-study}]\!] \wedge w \in [\![\text{J-fail}]\!]\} <_{likely}}$

$\underline{max_{\leq,w_C}\{w' : w' \in \neg[\![\text{J-study}]\!] \wedge w' \in [\![\text{J-fail}]\!]\}}.[\![\text{J-fail}]\!](w) = 1$

The set of worlds (maximally similar to the actual world) in which John both studied all night and failed the exam is less likely than the set of worlds (maximally similar to the actual world) in which John failed the test but did not study all night.

This correctly gets the truth conditions that John failed the test, with the presupposition that this is very unlikely given the context of him studying all night. Note also that this is essentially equivalent to the use of the scalar particle *even* here, which I will return to later.

Finally, Ippolito notes that there are dialects that accept an EXCLUSIVE *still*. This use has a scalar meaning like *only*, for which they give the following denotation.

(32) It is still 5 o'clock.

(33) $[\![\text{still}]\!] = \lambda D_{\langle st,t\rangle}.\lambda p_{\langle st\rangle}.\forall q \in C[q(w) \rightarrow (p \subseteq q)]$

In this case, *still* interacts with this variable C ranging over a salient set of propositions. Focus is expected to generate the correct salient set of propositions, in this example, with focus on *five*.

One thing worth highlighting about this analysis is that each denotation is linked by being a FSP, and there are similar syntactic assumptions made, but other than that, these denotations don't share commonalities. Each use of *still* has its distinct analysis. They deal with different semantic types, and they assert or presuppose different things. This is reasonable based on how different uses of *still* do appear with different types of things, but it opens up the question of why there is a morphological link or homophony between these uses. Nor is there a compositional link apparent between different uses of *still*. So is there some sort of spell-out rule that takes similar FSPs and pronounces them the same on the basis of the shared focus-sensitivity? Or what? These questions aside, this analysis successfully deals with the data that Ippolito sets out to deal with. I will take their analysis of concessive *still* and extend it to the relevant use of *still* in a comparative, before

proposing my own variation on their FSP theory. It is worth flagging, however, that this overall analysis already looks to be heading in a focus direction, instead of a degree direction, indicating that this may look more like a link between degree constructions and event constructions than it actually is.

4.3.2 Extending concessive *still* to comparatives

An analysis of concessive *still* can be extended directly to uses of *still* in a comparative. To hedge before I start, it's worth noting that the following sentences don't all seem to be completely identical.

(34)   a. Andrew is tall. I am still taller.

      b. Andrew is tall. I am taller still.

      c. Andrew is tall. Still, I am taller.

The versions in (34a) and (34b) seem to be slightly different from (34c), but not in a way that is truth conditionally distinct. In addition, some native speakers express a preference between the (a) and (b) options. However, if we shelf this ineffable distinction for the moment to discuss the overall phenomenon, the analysis of concessive *still* can be directly extended to *still* in comparatives, if we assume a structure like Ippolito's as well. In Ippolito's footnote discussing uses of *still* in a comparative, they observe that, like concessive *still*, this use of *still* in a comparative paraphrases well with *even* and suggests a similar to concessive *still*. While the argument in the previous chapter took disparate looking uses of FSPs and analyzed them as actually resulting from the same denotation, the reverse trend is occurring here, and Ippolito analyzes all of these different uses of *still* as different morphemes. Besides the homophony, the unifying factor is that they are FSPs, but Ippolito gives them their own denotation and assumes they appear in different structural positions to match. In addition to the different meanings and uses that Ippolito has separated out, there may be further syntactic evidence to treat at least some uses of aspectual particles as different from other homophonous uses. In this argument I will first consider data involving *yet* instead of *still*, because aspectual *yet* is known to be a negative polarity item (NPI), but recalling from the previous

data, both *still* and *yet* are aspectual particles that appear in comparatives. Consider the following contrast.

(35) She has *(not) left **yet**.

(36) He has mud on his boots. **Yet** it would be rude to refuse to let him in.

In (35), we can see that the aspectual use of *yet* is indeed an NPI, as it is ungrammatical outside of a downward entailing environment like negation. However, in (36) a use of *yet* like Ippolito's concessive *still* appears perfectly grammatically outside of an NPI environment. As *yet* can, like *still*, appear in a comparative in some dialects of English, we can see the same lack of NPI restriction again when we look at it there as well.

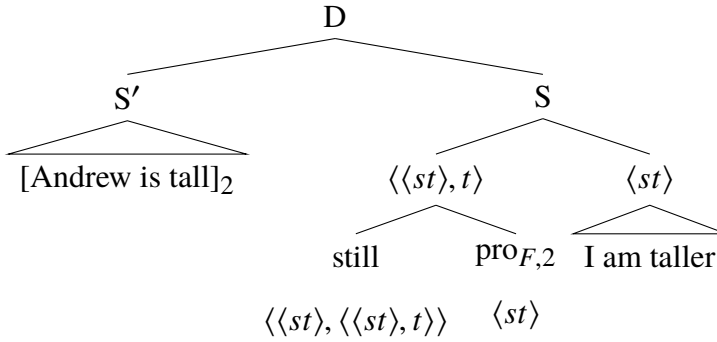(37) a. Andrew is pretty tall, at 6'1". At 6'3", I am taller **yet**.

      b. Andrew is pretty tall, at 6'1". At 6'3", I am **yet** taller (than he is).

This is not a known downward entailing environment, as *yet* does not appear to be in the standard phrase of the comparative. Given that the aspectual use of *yet* is an NPI and must appear in a downward entailing environment, the concessive and comparative uses of *yet* must be different from the aspectual use. While *still* is not an NPI and we therefore cannot run the same test on it, it seems reasonable to assume that this use of *still* could be a different one as well, given that they are seem to be otherwise doing the same thing semantically.

With this argument in addition to the previous ones, I will for the moment follow Ippolito in assigning a different denotation to different uses of *still*, and directly extend their denotation for concessive *still* to uses of *still* in a comparative, assuming other uses of *still* to be distinct. Below I have given a use of *still* in a comparative, the structure Ippolito would assume for it, and then a direct extension of their analysis for it. Again, the presupposition is included underlined even though what I have shown represents the end point of the computation, after the presupposition has been checked, so that we can see *what* has been checked. Then the whole result is paraphrased immediately after.

(38) Andrew is pretty tall. (At 6'3"), I am **still** taller.

(39)

```
                            D
                   ┌────────┴────────┐
                  S′                  S
              ┌────┴────┐      ┌───────┴───────┐
      [Andrew is tall]₂      ⟨⟨st⟩, t⟩         ⟨st⟩
                          ┌─────┴─────┐     ┌────┴────┐
                        still      pro_F,2  I am taller
                  ⟨⟨st⟩, ⟨⟨st⟩, t⟩⟩     ⟨st⟩
```

(40) $[\![\text{still}]\!]([\![\text{A-tall}]\!])([\![\text{I-am-taller}]\!]) = \underline{max_{\leq, w_C}\{w : w \in [\![\text{A-tall}]\!] \wedge w \in [\![\text{I-am-taller}]\!]\}}$

   $\underline{<_{likely} max_{\leq, w_C}\{w' : w' \in \neg[\![\text{A-tall}]\!] \wedge w' \in [\![\text{I-am-taller}]\!]\}}.[\![\text{I-am-taller}]\!](w) = 1$

   The set of worlds (maximally similar to the actual world) in which Andrew is tall but I am

   taller is less likely than the set of worlds (maximally similar to the actual world) in which

   Andrew is not tall but I am taller.

In the above tree, I directly replaced the relevant sentences, and kept Ippolito's structure and

denotations. The asserted meaning of the result is that I am taller than Andrew, which matches

speaker intuitions of what the given proposition asserts. The presupposition is that it is less likely

to be the case that Andrew is tall but I am taller than it is to be the case that Andrew is *not* tall

and I am taller. Or, to put it less technically and more succinctly, it was relatively unlikely that I

am taller than Andrew, given that he is pretty tall to start with. This is generally how the emphatic

effects of *even* is analyzed, in terms of a presupposition that this proposition was less likely than

competing propositions, so this seems to have worked out appropriately as well. At this point,

extending Ippolito's analysis of concessive *still* to uses of *still* in comparatives works perfectly well

and returns the correct results.

4.3.2.1   Problems, and an analysis of *at*-phrases

Here I will walk through two problems with this analysis, as motivation for reanalyzing concessive

still (in or out of a comparative) as *still* with proposition level focus. First, I will provide some data

showing that *still* can't be interacting with just the two adjacent propositions, which is an argument against the coindexed pro setup. Second, I will show that when *still* appears in a comparative with *at*-phrases, it ends up contributing solely a tautological presupposition. Both of these things will be an issue with directly extending Ippolito's analysis, but the changes I will end up proposing will address them.

To start with, *still* needs to be able to interact with more than just the one preceding proposition. Ippolito's structure represents sentences within a discourse and assumes they have a syntactic connection, so this analysis is capable of dealing with examples like (41), assuming that this is a syntax that can link the speech of two interlocutors. However, the pro in their theory is coindexed with a single sentence, so examples like (42) present an issue.

(41)   Alex: John had mud on his boots.

Brady: **Still**, I let him in my house. Even though I hate mud in the house.

(42)   Alex: John had mud on his boots.

Brady: He also insulted the host on Facebook the night before.

Cameron: To top it off, he showed up visibly drunk.

Danni: **Still**, I let him in my house. (Even though I hate mud in the house and rude guests. Although honestly I don't mind when John is drunk and I thought that was funny.)

This use of *still* in (42) seems to reflect on the context of Alex's, Brady's, and Cameron's utterances, not just the context of the previous sentence. If we include the parenthetical sentences, this shows that *Still, I let him in my house* cannot be taking into account the previous sentence only, and in fact does not need to take the previous sentence into consideration at all. Instead, the sentence immediately before is explicitly dismissed, meaning that *still* must be taking into account the two sentences before that in this case. This could be the result of *still* interacting with (some element of) the discourse context as a whole, or just interacting something other than the previous sentence. Following the previous chapter, if elements in the discourse are restricting what propositions could be interacting here, this is a thing we can test for, which I will return to when fleshing out my

analysis. For this section fleshing out issues with the current analysis, one more test for whether or not *still* interacts with the previous sentence is to include an embedded clause giving the relevant context.

(43)   Alex: I heard that John had mud on his boots.

Brady: **Still**, I let him in my house. $\left\{ \begin{array}{l} \text{Even though I hate mud in the house.} \\ \text{?Even though you heard that.} \end{array} \right\}$

In (43), this does not mean that Brady let John in their house even though Alex heard something, as it seems very odd to follow the sentence up by mentioning that. Rather, this means that Brady let John in their house despite the thing that Alex heard. It is totally natural to follow up by talking about the mud, not the hearing. This means that *still* cannot be necessarily interacting with the proposition before it in the discourse. Rather, the fact that it can be interacting with an embedded clause shows that it has to be interacting with something contextually present in the discourse. One concern about this embedding test is that *I heard that* might be acting as an evidential here, but I argue that it isn't a true evidential here, as it can be challenged (Murray, 2009).

(44)   Alex: I heard that John had mud on his boots.

Brady: You didn't hear that! You saw it yourself!

In (44), the truth conditions of the embedding clause can be challenged, indicating that it isn't a true evidential. In that case, (43) shows that the alternative set can be generated from a syntactically embedded proposition if it is generated from a proposition. Additionally we see this reoccur in different environments, such as more syntactically complex embeddings which are unlikely to be evidentials, like in (45) and under questions like in (46).

(45)   Alex: Danni told me that John had mud on his boots.

Brady: **Still**, I let him in my house.

(46)   Alex: Didn't John have mud on his boots?

Brady: **Still**, I let him in my house.

The embedding in (45) could be interpreted as obliquely indicating how Alex heard the embedded proposition, but it isn't necessarily the case, as they could just be informing Brady that the news of John's muddy boots is out. We do not want to analyze this as an evidential. As for (46), given that questions are usually analyzed as sets of propositions or sets of answers (Hamblin, 1973; Karttunen, 1977), it's not entirely clear what *still* would be interacting with in (46). The operator would have to be modified to interact with a set of propositions, or it could be interacting with the proposition below the question operator that theoretically generates the set, which would again be *still* interacting with something embedded. At this point, I conclude that Ippolito's analysis needs to be tweaked to at least make it clear how *still* can interact with something contextually relevant other than the previous proposition. The question is how to restrict the sentences that *still* can interact with more strictly than just saying the ones that are "contextually relevant". In order to have a good hypothesis that makes clear predictions, I want ask a question like what element(s) in the discourse does this interact with?

Another problem with this analysis of concessive *still* involves looking specifically at when *still* appears in a comparative, whereupon if an *at*-phrase is included, this makes it clear that *still* is potentially including only a tautological presupposition. To illustrate what the problematic tautological presupposition is, consider the following data where comparatives are shown that include adjunct *at*-phrases.

(47) a. Andrew is pretty tall, at 6'1".

  b. At 6'1", Andrew is pretty tall.

  c. I am taller than Andrew, at 6'3".

  d. I am, at 6'3", taller than Andrew.

  e. At 6'3", I am taller than Andrew.

These *at*-phrases are optional, and as (47) shows, they can appear in a variety of positions in the sentence. I will sketch out a brief analysis for the sake of the point here, but a short approximation of what (47a-b) should mean for example, is something like *Andrew is pretty tall ∧ Andrew is 6'1"*.

In the comparative in (47c-e), it again has this conjunctive meaning like *I am taller than Andrew ∧ I am 6'3"*.

This data indicates that these *at*-phrases are syntactically adjuncts. In addition to its optionality and it syntactic position being flexible, it is often set off by pauses, as when fronted. In terms of their semantics, though should they be analyzed as a regular part of the proposition or something different? It could be an asserted part of the sentence, or if not, perhaps it could be like an appositive or another parenthetical. Consider the structures in the following data from Potts (2003).

(48)   a.   Ames, a successful spy, is now behind bars.

       b.   Ames, who was a successful spy, is now behind bars.

The *at*-phrases in (47) do look like the appositive and relative clause in (48). Potts (2003) argues that appositives, some relative clauses, and some similar structures are conventional implicature (CI). Unlike conversational implicature, conventional implicature is not cancelable, and their contribution to the semantics has to be computed within a sentence rather than inferred from the discourse. The idea in Potts' analysis is that conventional implicature is calculated within a sentence, but on a separate level from the other asserted parts of the proposition. For this tentative analysis of *at*-phrases, I am not going to take a stance on whether they are CIs or not, as they will pose a problem for Ippolito's analysis regardless and they will be dealt with in my analysis regardless. I will simply assume that they are present somewhere in the truth-conditions of the proposition as a whole.

At-phrases certainly aren't a part of the basic comparative structure, but like many adjuncts, they can be paraphrased conjunctively. As I am not fleshing out a full analysis of *at*-phrases here and it does not need to slot in to my analysis of comparatives from Chapter 2, I would like to borrow an intuition from Schwarzschild (2012), where his analysis of comparatives is constructed conjunctively, in order to present this analysis clearly.

When we plug a comparative with *at*-phrases into our extension of Ippolito's analysis of concessive *still* to *still* in comparatives, the problem that emerges is a subtle one of uninformativeness. The following example is not stepped through, but rather for clarity and brevity the propositions

are left un-unfolded. As a reminder, the presupposition is included in the underlined portion, even though it should have already been checked at this stage of the derivation. Here, it is the important part to look at for finding the uninformativeness.

(49)   Andrew is pretty tall, at 6'1". At 6'3", I am **still** taller.

(50)
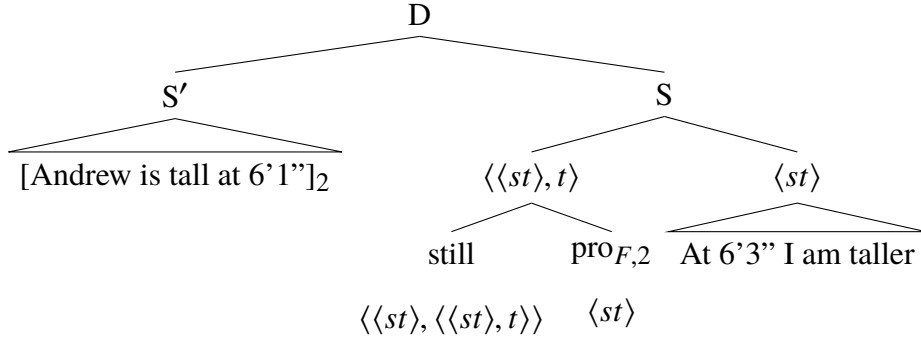
(51) $[\![\text{still}]\!]([\![\text{A-6'1"-tall}]\!])([\![\text{I-am-taller-and-6'3"}]\!]) = max_{\leq,w_c}\{w : w \in [\![\text{A-6'1"-tall}]\!] \wedge w \in$ $[\![\text{I-am-taller-and-6'3"}]\!]\} <_{likely} max_{\leq,w_c}\{w' : w' \in \neg[\![\text{A-6'1"-tall}]\!] \wedge$ $w' \in [\![\text{I-am-taller-and-6'3"}]\!]\}.[\![\text{I-am-taller-and-6'3"}]\!](w) = 1$

The set of worlds (maximally similar to the actual world) in which Andrew is 6'1" tall but I am 6'3" and taller than him is less likely than the set of worlds (maximally similar to the actual world) in which Andrew is not 6'1" tall but I am 6'3" and taller than him.

The more likely set of worlds here are the ones in which Andrew is not 6'1", I am 6'3", and I am taller than him. If Andrew is not 6'1", then he is necessarily shorter than that, as technically an individual who reaches 6 feet of height also reaches 5 feet, 4 feet, and so on. Therefore, if Andrew is shorter than 6'1" and I am 6'3", it is *necessarily* true that I am taller than he is. Therefore the more likely set of worlds are ones in which this tautology is true. The less likely set of worlds are the the otherwise equivalent worlds in which Andrew *is* 6'1", and I am 6'3" and taller than he is. I may or may not be taller than he is if I am 6'3", as if Andrew is 6'3" he could technically be taller, as long as he is no shorter. So this proposition is not a tautology. Therefore, the only difference between these two sets of worlds is that the more likely set has a proposition that is tautological, and the less likely set has instead a proposition that isn't. This presupposition is necessarily met

with this sentence, meaning it is semantically uninformative. The contribution of *still* is generally analyzed as being in the weight of the presupposition, as the asserted content is just *p*, so *still* is not going to be semantically informative in the asserted content either.

Although this analysis of *still* predicts that it is semantically uninformative, this sentence is perfectly normal, no oddness from superfluous phrasing, nor does it even sound redundant. Instead, it only comes off as a more emphatic sentence than it would be without *still*. Additionally, while this example is with Ippolito's denotation for concessive *still*, remember that this analysis for concessive *still* is essentially identical to an analysis of *even*. *Even* can, just like concessive *still* go in similar high positions, and in exactly the same position within a comparative, and also it also sounds perfectly natural and neither odd nor redundant in those positions.

(52)   Alex: John had mud on his boots.

       Brady: Even so, I let him in my house.

(53)   Andrew is pretty tall, at 6'1". At 6'3", I am **even** taller.

(54)   a. This game was bad. That one was even worse.

       b. This game was bad. That one was still worse.

Given that this analysis presents this issue for *still* and that Ippolito's analysis for *still* is constructed identically to how *even* works, this is also a problem for *even* in sentences like (52) and (53). This uninformativity isn't a problem that seems like it should result in ungrammaticality, so much as it predicts a result similar to the effects of repetition. A sentence like *A dog entered and then the one dog sat down* is a good correlate, where it is uninformative by repeating that there's one dog when we already know this from it's introduction. This sentence is not ungrammatical, just it sounds odd in that it is repetitious.

While I will suggest a different analysis that explains how this presupposition may not be uninformative, I want to first mention that there is a way to analyze the uninformativity of the presupposition as contributing something anyway. The uninformativity could be in a Gricean way the root of the contribution of *still*. Impressionistically the contribution could be described as some

kind of emphasis. The principle of Maximize Presupposition suggests that if a presupposition *can* be used, it *must* be used (Heim, 1991; Sauerland, 2008). Cooperative interlocutors make the strongest claims possible when speaking, in order to maximize informativity (Grice et al., 1975). In this case of a tautological presupposition, the uninformativity of the presupposition does not make for a stronger claim. This seems to negate the pragmatic benefit of using the strongest presupposition possible, but it could be analyzed as being the reason that an emphatic flavor results instead. One could argue that the emphasis results from using a form with a theoretically stronger presupposition than a form without one because including *still* or *even* makes for a more marked form than not including them. Even though *still* or *even* contribute only tautological information, the use of a more marked form itself contributes something pragmatically. According to Acton (2014), part of the work that a listener does in a conversation is compare the phrasing they hear with what seems like viable alternatives, working on a sort of "what does it mean that they said it in this way not that way" question. Therefore, using a marked form when a less marked form exists pragmatically indicates that must be a reason why the speaker used the more marked form instead. Returning to the question of the tautology, if the alternative has effectively the same meaning, then the reason for using the marked form can't be due to a slight change in meaning. The contribution of *still* or *even* here could be a pragmatic emphasis in lieu of an informative presupposition or assertion. While I do not find this argument unconvincing, it doesn not present a clear argument in favor of any semantic analysis, Ippolito's or otherwise. Instead, the analysis I will propose for concessive *still* provides an explanation for why it conveys emphatic flavor while providing an analysis in which the presupposition is *not* tautological.

4.3.2.2 Reanalyzing concessive *still* as proposition level focus

Ignoring for the moment the issue brought up with *at*-phrases, the first problem for Ippolito's analysis is that it has *still* use the preceding sentence, whereas I have presented evidence that the preceding proposition is not necessarily the context it should interact with. Instead, it needs to interact in some way with the larger discourse context. I propose that reanalyzing concessive *still*

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and *even* as regular FSPs involving proposition level focus would solve this problem.

As a reminder, I proposed that proposition level focus is possible, and focus sensitive expressions can interact with it, but the examples we have seen so far showed that some further restriction must be in play as well. According to Rooth (1996), focus should generate the set of possible things of the same type as the focused constituent. So in the case of focusing a proposition, this should generate a set of possible propositions. This is not restricted in any way that would make sure these propositions are semantically or syntactically similar to the focused element, just restricted to things that are possible propositions. This was too unrestricted to be informative for discourse *also*, and for concessive *only* it was too unrestricted to result in a true assertion. Instead, in both of these cases I proposed that the discourse serves in some way to further restrict the alternative set in order to make it informative. Instead of C being a "contextually restricted subset of $[\![\alpha]\!]^{f}$", it is a subset of $[\![\alpha]\!]^{f}$ that is defined using objects in the discourse, thus formally defining what it means to be "contextually restricted". Given Ippolito's analysis of *still* as a FSP, and the parallel with the prototypical FSP *even*, I have the same expectations here that an analysis of these with proposition level focus could reveal a discourse-based contextual restriction that yields these results.

The asserted content of *even p* is usually assumed to just be *p*, in Ippolito's analysis and others. In this case, the presuppositional effect *even* or *still* should have is to say that *p* is true, and it is less likely than the other options *q* in the focus set of alternatives. Ippolito added a conjunctive element in their analysis of concessive *still* specifically, which could be paraphrased as *it is less likely that p and q are true than it is that p is true and q is false*. In order to think about that, let's look at some data involving proposition level *even*, as it seems to parallel proposition level *still*.

(55)   John failed the exam even though he studied all night.

(56)   John studied all night. Even so, he failed the exam.

(57)   # Even, [John failed the exam]$_F$.

Both (55) and (56) have 2 propositions, linked by *even* as though it were a conjunction linking propositions. In the latter, *so* can be analyzed as referring to the previous proposition, so it might

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not necessarily have to be syntactically a full proposition here, so much as have the semantics of one. This data indicates that *even* with proposition level focus, or concessive *even*, must necessarily appear with (at least) two propositions. In (57), if we assume proposition level focus and do not prosodically stress any smaller constituent, this is ungrammatical without any anaphoric *so* included after *even*. In comparison, consider a use of *even* with a smaller constituent focused.

(58)   Even **John** failed the exam.

In (58), *even* only interacts with one proposition and it is perfectly grammatical. We do need to accommodate that the likelihood of John failing was slim, or something, but it is perfectly fine for this use of *even* to appear with only one proposition. Unless this is because the second proposition is that John was likely to fail, and this proposition is extremely easy to accommodate, this appears to be a difference between the two uses. Even so, it is possible that it is not a difference, and we are accommodating some presupposition, but consider the difference between (58) and (59).

(59)   # Even so, [John failed the exam]$_F$.

Neither is perfect out of the blue, as some accommodation is needed for (58), but the sentence in (59) is definitely worse, being totally unacceptable out of the blue. Perhaps this is because we cannot accommodate that something happened that would have made it less likely for John to fail. However, there is no immediately apparent reason why one presupposition can be accommodated that much easier than the other if they are both simply presupposing the veracity of another proposition. The presupposition of (58) can also be directly addressed with a *hey-wait-a-minute* style test, but trying to run one with (59) is noticeably harder, and it is not immediately clear what objection should be made.

(60)   Alex: Even **John** failed the exam.

        Brady: Hey wait a minute, I thought John was someone we thought likely to fail! That's not surprising!

(61)   Alex: Even (so), John failed the exam.

        Brady: Hey wait a minute...

a.   # I didn't know he studied!

b.   # I didn't know he bribed the instructor!

c.   Was there some reason we thought he wouldn't?

d.   You didn't say anything about him being unlikely to fail.

In the case of (60), the presupposition is easily targeted, and it can be flagged when there is failure of presupposition. In (61) this is not as easy. An objection can be made, but it is very odd to try to accommodate a specific reason that it was unlikely or surprising that John failed the exam, as (a) and (b) show. The most successful follow up seems to be the metalinguistic sort of objection that doesn't accommodate a specific reason but rather just flags a failure of presupposition, as we see in (c) and (d). It is not entirely clear why this presupposition failure is unrecoverable, unless it is the case that this is not presupposition failure, but rather *even* requires two propositions locally when interpreted with proposition level focus.This looks like an argument that for *even*, its requirements are slightly different between its use with proposition level focus and its use with smaller constituents focused. This is not totally in line with the argument in the previous chapter, which predicts that if an expression is focus sensitive with smaller constituents focused, it should have the potential to interact with a focused proposition. However, this potential is all that is predicted, not a necessary interaction, as something else could potentially block any particular focus sensitive expression from interacting with a focused proposition. Regardless, this is evidence that *even* must have two propositions locally when interacting with proposition level focus, but not when interacting with smaller focused constituents. To return to *still*, we do see a similar effect if there are not at least two proposition in the discourse for it to reference, although there are syntactic differences in how the propositions are linked, which I will return to imminently. The following two uses of *still* attempt to mirror the distinction with *even*, but given that *still* does not typically have a focus sensitive use with focused constituents smaller than a proposition, I have shown its typical temporal use in comparison. The temporal use of *still* presupposes that the state or event was previously ongoing, as it asserts that it is currently ongoing. The concessive use of *still* is like *even* with proposition level focus in its presupposition that this is unlikely, given something else.

(62) John is still cooking.

(63)   # Still, John failed the exam.

Again we can easily accommodate the temporal presupposition *and he was cooking before* from (62), but the concessive use in (63) is very difficult to accommodate, and for me at least it is fully infelicitous out of the blue. It makes sense to continue to analyze *even* and *still* along the same lines here, but *even* has already shown itself to be a little less straightforward than *also* was. To return to the syntactic differences with *even* and *still*, it is the case that concessive *even* must either overtly connect two propositions, or appear as *even so* when attached to only one full proposition. *So* has been analyzed as being anaphoric to a handful of things, including events, in which case it makes sense to analyze *so* as being anaphoric to another proposition in this case (Landman & Morzycki, 2003). *Even* with proposition level focus cannot appear with only one proposition locally. However, *still* does not pattern the same. It does not replaces a conjunction when linking two propositions nor does it appear with an anaphor like *so*. Instead, *still* needs the help of an overt conjunction if it is going to link two propositions. Exact minimal pairs are not possible because the order of the two propositions switch for *even* and *still*, but consider the following attempt at near-minimal pairs.

(64) a. John failed the test, even though he studied all night.

      b. John studied all night. Even *(so), he failed the test.

(65) a. John studied all night, *(but/and) still he failed the test.

      b. John studied all night. Still (*so), he failed the test.

In (64), *even* necessarily interacts with two propositions locally, as has been discussed. However, in (65), *still* necessarily has only one overt proposition locally, although it still needs at least one other proposition available recently in the discourse, and can't appear out of the blue. When it appears between two propositions in the (a) version, a conjunction is needed, and *still* is simply incompatible with the propositional pronoun *so* in (b). One possibility is that *still* could involve two propositions like concessive *even* if it were to have a covert pronoun like *so*, corresponding with the other proposition. However, I think this is not quite the right analysis. Concessive *even*

must explicitly take in two propositional arguments. But *still* may be taking in one propositional argument, and accessing the other in the traditional FSP way of referencing the focus semantic value of the same proposition, different from how *even* appears to be acting when it has proposition level focus. Instead, this is more on par with an analysis of *even* with a smaller constituent focused, in that it only involves one proposition locally, and anything else comes from $[\![p]\!]^f$. This also makes sense with the earlier data showing that *still* can be accessing a proposition or propositions that are not immediately adjacent, and are in fact across discourse participants. So *still* can only have one proposition syntactically local, like *even* with low focus, but it needs at least one proposition available in the discourse already, like *even* with proposition level focus. Given how concessive *even* appears to differ syntactically from *still*, it makes sense to analyze the two as slightly different in how they access the two propositions in their denotation, but overall I think it makes sense to follow Ippolito's conjunctive approach in the denotation for *still* and *even*. This does involve deviating slightly from what *even* without proposition level focus is said to do, but to reconsider two previous examples, *still* does not pattern like that *even*.

(66)   Even **John** failed the exam.

(67)   # Still, John failed the exam.

Unlike *even* in (66), *still* in (67) is not recoverable without further background. Out of the blue it is totally unacceptable, whereas *even* can be accommodated in (66). A denotation for *still* should take into account that something else is needed, if not syntactically locally, then close by in the discourse. Regular analyses of *even* generally intend to assert p, with the presupposition of *p is less likely than other propositions q (which is from the focus set of alternatives)*. To incorporate this conjunctive approach from Ippolito's analysis of concessive *still*, concessive *even* or *still* would still asset p, but the presupposition would be something like *p and q both being true is less likely than p and ¬q being true*.

To start with *still*, as a typical FSP, it should access some proposition q via the focus semantic value $[\![\alpha]\!]^f$, in addition to referencing p. Rooth (1996) references a contextually restricted version

of the focus semantic value, C, but I would like to, following my proposals in the previous chapter, more precisely define how the alternatives in the focus set are restricted. So far I have assumed a Table sort of format, of the kind developed by Farkas & Bruce (2010) and further refined by Taniguchi (2017), and provided arguments for adding goals to this discourse structure. This kind of articulated discourse structure allows us to make more precise predictions about what we mean when something is affected by "the context". What I propose to do here is to do the same thing as in the analysis in the previous chapter: work with a general FSP style denotation for still which assumes a C that is restricted in some way, then define exactly how C is restricted from the focus semantic value. So to start, here is a denotation for FSP *still* that follows Ippolito's conjunctive approach as discussed, but is adapted to only syntactically interact with one proposition p and access a C for its q.[1]

(68) $[\![\text{still}]\!] = \lambda p : \exists q[q \in C \land ((p \cap q) <_{likely} (p \cap \neg q))].p$

In terms of the denotation for *still* in (68), I am assuming again for convenience that *still* applies high, taking in a proposition with a non-unary focus semantic value. I have simplified the formalism from Ippolito's version, but here I also have the asserted content as just pm and the presupposition is that is is less likely that both p and q are true than it is that p is true and q is not. Unlike in the previous chapter, this is not a general denotation intended to work for all uses of this FSP, but again following Ippolito's arguments for different versions of *still*, this will only work for concessive *still*, and it must interact with focus. This moves somewhat away from the cohesion of the previous chapter, but I think enough evidence has been presented to show that *still* is an odd case and merits being treated as such. The next step is to figure out what objects in the discourse seem to be what is restricting the focus semantic value of that proposition to C. This analysis assumes proposition level focus, which if unrestricted, generates a focus semantic value containing the set of possible propositions. Given the denotation in (68) above, this will end up, like with *also* and discourse

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[1]Note that I have drastically simplified the intensional aspect of Ippolito's formula here. While the intensionality is important, it is not the focus here. Given that a proposition denotes a set of worlds, we are interpreting $p \cap q$ to be the set of worlds consistent with both. I write $\neg q$ as shorthand to indicate the set of worlds in which q is not true.

addition in the previous chapter, being uninformative by the presupposition being vacuously met. If every possible presupposition is in C, then it must be the case that there exists some proposition q in there that makes it more likely for p to be true if it is true than if it is not. For example, consider the following set of propositions, which is a subset of what could be generated with an unrestricted $[\![p]\!]^f$.

(69) Still, [John failed the exam]$_F$

$$[\![\text{John failed the exam}]\!]^f = \left\{ \begin{array}{l} \text{John took the exam.} \\ \text{John tried to pass the exam.} \\ ... \end{array} \right\}$$

In (69), these are two of the possible propositions that would be generated in an unrestricted $[\![p]\!]^f$, and both of them I think fulfill the presupposition in (68) in that they effectively need to be true in order for p to be true. The C needs to be further restricted in order to make this presupposition meaningful. In addition, the right restriction would explain when *still* is felicitous and when it is not, based on what is in the discourse. So far, we have seen evidence that *still* can take a q from the CG, but I propose that, like *also*, *still* can also take a proposition q from the Table. Consider the following example showing that the q for *still* can come from something not yet entered into the CG.

(70) Alex: John studied all night, and still he failed the exam.

Brady: I know for a fact that he studied until 11pm and then he came to my party, actually. But he definitely did fail that exam!

In (70), the relevant q that makes p more likely is that *John studied all night*. Here, I argue that it is still on the Table, not on the CG, because Alex gave two propositions at once, rather than waiting for their interlocutor to agree to add q to the CG, and because Brady then explicitly rejected that proposition, blocking it from entering the CG. Based on this, the restriction I am proposing looks as follows.

(71) **Discourse restriction for *still***: $C \subset (CG \cup T)$

The restriction in (71) predicts that *still* should now only be able to access things that have already been said when looking for a *q* that makes *p* more likely to be true, and achieves the effect that *still* does not need to be immediately after the relevant *q*. This vastly restricts the set and will rule out vacuous options like in (69), predicting that *still* will only be felicitous when it follows an overt proposition that makes *p* more likely. This is also a very simple restriction, easy to frame using objects in the discourse and not needing anything new. Like the analysis in the previous chapter, it makes sense to treat this discourse restriction as something lexically encoded, and therefore existing within the denotation for *still*, although in (71) I only included the restriction, not the whole denotation. This hypothesis works for cases like the one repeated here in (72), where we want *still* to interact with multiple propositions, or not necessarily the preceding one.

(72)   Alex: John had mud on his boots.

        Brady: He also insulted the host on Facebook the night before.

        Cameron: To top it off, he showed up visibly drunk.

        Danni: **Still**, I let him in my house. (Even though I hate mud in the house and rude guests. Although honestly I don't mind when John is drunk and I thought that was funny.)

In (72), *still* is considering the propositions said by Alex and Brady, but ignoring the one from Cameron. If $[\![p]\!]^{\text{f}}$ contains propositions in The CG or on the Table, then it should look as follows.

(73)   Still, [I let him in my house.]$_F$

$$C = \left\{ \begin{array}{l} \text{John had mud on his boots} \\ \text{He insulted the host on Facebook the night before.} \\ \text{~~He showed up visibly drunk.~~} \end{array} \right\}$$

The set in (73) includes all of the propositions that are in $(CG \cup T)$ in this toy example. However, considering the part in the parentheses in (72), one of these propositions should not affect the likelihood of them letting John in their house. This proposition does not meet the requirements of *still*'s presupposition, which I have marked about by striking it out. Either of the other two should check that presuppostion, though, so *still* is felicitous. In the event that *still* is interpreted

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as meaning p is true even though *both* of these propositions is true, I think this still works. If two propositions p and q are both in the $(CG \cup T)$, then we want to conclude that this set contains $p \wedge q$. If we consider that some proposition r is equivalent to $p \wedge q$, then this set also contains r. In this example, r is equivalent to *John had mud on his boots and he insulted the host on Facebook the night before*, and this is the proposition considered in the presupposition for *still*.

This analysis of *still* as a FSP with proposition level focus and a discourse restriction on C is working for far for concessive uses. At this point, we should be able to apply this concessive use to uses of *still* in a comparative, and then if the analysis is successful, it is an argument that aspectual particles in comparatives do not support a theory where event structures can be built into degree structures. To look at a use in a comparative, we expect the following to be the focused element.

(74)   Andrew is pretty tall. I am still taller.

      Still [I am taller]$_F$

The focus in (74) is on the proposition as a whole, which means that the focus semantic value is the set of possible propositions. The discourse restriction cuts that down to only propositions in $(CG \cup T)$ to get C, at which point C contains *Andrew is pretty tall*. This gives us the following result with our given denotation for *still*, where for clarity the presupposition is included past where it should have been checked, but underlined. This computation is broken down into steps in order to make it clear how the presupposition is checked with the given discourse, and what the result is.

(75)   a. $[\![\text{still}]\!] = \lambda p : \exists q[q \in C \wedge ((p \cap q) <_{likely} (p \cap \neg q))].p$

        Where $C \subset (CG \cup T)$

     b. $[\![\text{still}]\!]([\![\text{I-am-taller}]\!]) = \lambda p : \exists q[q \in C \wedge ((p \cap q) <_{likely} (p \cap \neg q))].[p]([\![\text{I-am-taller}]\!])$

        $\underline{= \exists q[q \in C \wedge (([\![\text{I-am-taller}]\!] \cap q) <_{likely} ([\![\text{I-am-taller}]\!] \cap \neg q))].[\![\text{I-am-taller}]\!]}$

     c. C contains whatever propositions are in $(CG \cup T)$, but *Andrew is pretty tall* is the one that should check the presupposition, so it would work for q.

     d. $\underline{= [\![\text{Andrew-tall}]\!] \in C \wedge (([\![\text{I-am-taller}]\!] \cap [\![\text{Andrew-tall}]\!]) <_{likely} ([\![\text{I-am-taller}]\!] \cap}$

        $\underline{\neg [\![\text{Andrew-tall}]\!]))[[\![\text{I-am-taller}]\!]]}$

The above computation in (75) is broken into steps. In (a) I have repeated the new denotation for *still*, and in (b) I have applied it to the proposition *I am taller*, which then substitutes for *p*. The presupposition is included, but underlined in (b), as I have separated out the presupposition checking step into (c) for clarity. In theory *C* would contain more propositions than just the prior one in a full discourse. However, the prior one is the one we care about here, as it checks the proposition, and then we see it replace *q* in (d), where the presupposition is underlined to show clearly what requirement has been met. However, the final assertion is just that I am taller than Andrew. Thus the requirement for *still* that it follow something making *p* unlikely is met via the presupposition, and correctly it then does not affect the asserted content of the proposition.

This analysis successfully extend concessive uses of *still* to include uses in comparatives. However, as the previous section showed, comparatives with *at*-phrases posed an extra issue for Ippolito's analysis of concessive *still*. I argue that this analysis of FSP *still* with a discourse restriction successfully deals with this data.

(76)   Andrew is pretty tall, at 6'1". At 6'3", I am **still** taller.

As a reminder, data like (76) posed an issue to Ippolito's model because it presupposed something like it is less likely that Andrew is 6'1" and I am 6'3" and I am taller than he is than it is than he is less than 6'1", I am 6'3", and I m taller than him. This is necessarily true, which makes *still* contribute nothing, and raises the question of why this is acceptable if it is totally redundant. If we look at this with my analysis, we expect a *C* like the following one.

(77)   Still, [at 6'3", I am taller]$_F$

$$C = \left\{ \begin{array}{l} \text{\sout{Andrew is pretty tall, at 6'1".}} \\ \text{Andrew is pretty tall.} \\ \text{\sout{Andrew is 6'1".}} \end{array} \right\}$$

This set in (77) includes the propositions that we can expect ($CG \cup T$) to include from (76). Whether we take the *at*-phrase to be conventional implicature or asserted content, both *Andrew is pretty tall* and *Andrew is 6'1"* should end up in the CG or on the Table. No matter how the

at-phrase is interpreted, the content of the first sentence in (76) should be ⟦Andrew is pretty tall⟧ ∧ ⟦Andrew is 6'1"⟧, even if the second conjunct is added to the CG via a different mechanism than the first conjunct. If the CG contains $(p \wedge q)$, then we can conclude that the CG also contains p, and it also contains q, which means that the second and third lines in the above set are in $(CG \cup T)$, and therefore members of C with the current discourse restriction for *still*. Given that the denotation I am working with follows Ippolito's, two of them will create the same issue of redundancy and uninformativity. Like in the previous example, those two are struck out above. However, this leaves one proposition that does not make the contribution of *still*'s presupposition redundant. That proposition checks the presupposition without it being totally redundant or uninformative.

Switching from Ippolito's analysis to this slightly modified one thus solves both of the issues I have pointed out. The conjunctive approach has been maintained, but the reliance on proposition level focus allows the multiple local propositions to be involved, not just the two adjacent ones. The issue of *at*-phrases is solved in the same way. Interpreting *at*-phrases conjunctively, and drawing C from $(CG \cup T)$ allows *still* to reference just one of those conjuncts. This modification to Ippolito's analysis works well to extend a FSP analysis of concessive *still* to uses of *still* in a comparative. At this point, this working analysis means that seeing a typically aspectual particle in a comparative is not automatically data that supports a link where event constructions compositionally building to degree constructions.

4.3.2.3 Extending that analysis to *yet*

The data I began this chapter with included *still* and *yet* both in comparatives. Therefore I must now ask whether this analysis works for *yet* as well, or does that data present a possible link between event constructions and degree constructions still? I previously presented NPI data showing that the *yet* that appears in comparatives and with the same concessive use is not an NPI, as opposed to the canonical temporal *yet*. In addition, we see the same pattern of at least two different uses of *yet*, a temporal one and this concessive one. I suggest this is evidence that, like my and Ippolito's treatment of *still*, we should be treating this as simply a different *yet* than the temporal one. Minimally, I just

take this as evidence that I can assign concessive *yet* its own denotation independent of its temporal use. However, if *yet* follows the full FSP paradigm that Ippolito sketches out for *still*, that would be evidence in favor of a parallel analysis for *yet*. Below I have repeated the data that Ippolito gives for different types of *still* in the (a) versions, and created parallels with *yet* in the (b) versions.

(78) Aspectual *still/yet*

    a. John is **still** cooking.

    b. John is not **yet** cooking.

(79) Marginality *still/yet*

    a. Compact cars are **still** safe; subcompacts start to get dangerous.

    b. Compact cars are not **yet** dangerous; subcompacts start to get dangerous.

(80) Concessive *still/yet*

    a. John studied all night. He **still** failed the test, though.

    b. John studied all night. **Yet** he failed the test.

(81) Exclusive *still/yet*

    a. Got an A! I was jumping for joy (internally, keep in mind it's **still** 8am).

    b. Exclusive *yet*: Got an A! I was jumping for joy (internally, keep in mind it's 8am **yet**).[2]

(82) Use in a comparative

    a. A **still** greater offer came from the Dean.

    b. A **yet** greater offer came from the Dean.

    Although I analyzed the use of *still* in a comparative as a type of concessive *still* in the previous section, above I include it separately. For each of Ippolito's examples with *still*, I created a parallel

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[2]Recall that Ippolito said this use is dialectal, and it was particularly hard for me to construct a parallel with *yet*. For me, *yet* had to be an NPI when I tried, and adding negation made it hard to see if it was acting as an exclusive particle. Instead, I consulted a speaker of American English who has non-NPI *yet* in their dialect, and they confirmed this is acceptable to them, although they preferred *it's early yet* over specifying 8am.

version with *yet*. These are not necessarily minimal pairs, as some uses of *yet* are NPIs, so I needed to add negation in those cases to license them. This is the case for the aspectual and marginality uses in (78) and (79). In (80), the concessive use of *yet* is not an NPI, but as can be seen above, *yet* must be in a different position than *still*. I do not want to say much about the exclusive case in (81), due to dialectal difficulties, but I am assured that this exclusive use is acceptable, and again we see only minor syntactic differences. Then in the comparative cases in (82), *still* and *yet* are totally interchangeable. While this only shows some of the FSP uses that Ippolito discusses, the additive and scalar, this presents evidence that we can treat *yet* as having different focus sensitive uses here the same as *still* does. I am not going to copy in the analysis of all of the different uses of *still* to apply them to *yet*, as this strays away from my goal here, but I will instead extend the analysis of concessive *still* in and out of comparatives to *yet*. Directly extending an analysis and denotation from *still* gives a structure as follows.

(83)   Andrew is pretty tall. I am taller yet.

Still [I am taller]$_F$

In (83), as before, the focus semantic value is the set of possible propositions. Then the discourse restriction cuts that down to only propositions in the the CG or on the Table, at which point C contains *Andrew is pretty tall*. This gives us the following result, where for clarity the presupposition is included past where it should have been checked, but underlined. I have again broken the process down into steps which include explicitly checking the presupposition.

(84)   a. $[\![\text{yet}]\!] = \lambda p : \exists q[q \in C \wedge ((p \cap q) <_{likely} (p \cap \neg q))].p$

Where $C \subset (CG \cup T)$

b. $[\![\text{yet}]\!]([\![\text{I-am-taller}]\!]) = \lambda p : \exists q[q \in C \wedge ((p \cap q) <_{likely} (p \cap \neg q))].[p]([\![\text{I-am-taller}]\!])$

$= \underline{\exists q[q \in C \wedge (([\![\text{I-am-taller}]\!] \cap q) <_{likely} ([\![\text{I-am-taller}]\!] \cap \neg q))].[[\![\text{I-am-taller}]\!]]}$

c. C contains whatever propositions are in $(CG \cup T)$, but *Andrew is pretty tall* is the one that should check the presupposition, so it would work for q.

d. $= [\![\text{Andrew-tall}]\!] \in C \wedge (([\![\text{I-am-taller}]\!] \cap [\![\text{Andrew-tall}]\!]) <_{likely} ([\![\text{I-am-taller}]\!] \cap$

$\neg[\![\text{Andrew-tall}]\!]))[[\![\text{I-am-taller}]\!]]$

The steps in (84) are identical to those in the analysis with *still*, which matches the native speaker intuitions that *still* and *yet* are effectively interchangeable in these concessive locations and in comparatives. Speakers do tend to have preferences between *still* and *yet* in comparatives, in addition to preferences about whether they come before or after the adjective, and this analysis says nothing about why that is. However, extending the analysis of *still* to *yet* makes one important overarching point. Again, I have presented data that appears to create a degree interpretation using expressions that are typically analyzed as having event related meaning. And again, I have presented an analysis for it that shows that this can be explained in a different way. An analysis like Ippolito's, but one where it relies on proposition level focus and discourse restrictions on *C*, fits the data well, meaning that this is also not evidence of event constructions compositionally building into degree constructions.

4.3.3   Returning to *even*

While all of the data I have promised to address has been addressed, the relation of *still* and *yet* with *even* in this analysis brings up the question of how to bring this analysis back to *even*: what differences do we want a denotation of concessive *even* to have from regular denotations for *even*, and what differences do we want it to have from *still*? To start with, *even* has to syntactically interact with two propositions, not one, and not in the same order as *still* does.

(85)   John studied all night. Still, he failed the test.

(86)   John failed the test, even though he studied all night.

In both of these, we can paraphrase this as *John failed the test (which was unlikely considering he studied all night)*, which I will for the moment relabel as *p (which was unlikely considering q)*. In (85), we see that *still* merges with *p*, but in (86), we see that *even* merges first with *q* and second

with *p*. So the order of the arguments needs to change when adapting the denotation for *still* to concessive *even*. The following denotation incorporates these two changes.

(87) $[\![\text{even}_{concessive}]\!]v1 = \lambda p \lambda q : (q \cap p) <_{likely} (q \cap \neg p).p$

In (87), the order of the propositions in the presupposition are changed, and *q* is now required via lambda instead of existentially quantified. Otherwise, the denotation is the same. It is worth checking whether the assertion should be the same, or if the different syntactic configuration is also correlated with a different assertion configuration as well. That is, is *q* now asserted in addition to *p*?

(88) Alex: John failed the test, even though he studied all night.

    a. Brady: That's not true! He didn't fail the test! (He did study all night though.)

    b. Brady: That's not true! He didn't study all night! (He did fail the test though.)

In (88), speakers report that the sentences in the parentheses feel redundant, like there's no need to mention that it's true when that is the default assumption, but they otherwise find both objections acceptable. This shows that the truth of both *p* and *q* is asserted, as both can be straightforwardly rejected as false. Incorporating that gives us the following denotation.

(89) $[\![\text{even}_{concessive}]\!]v2 = \lambda p \lambda q : (q \cap p) <_{likely} (q \cap \neg p).p \wedge q$

In the second version in (89), the additional change is that both *p* and *q* are now asserted. This deviates from standard analyses of *even*, but I will return to that topic later, once we're done with concessive *even*. At this point, this second version denotation has a working argument structure, presupposition, and assertion in line with how concessive *even* functions. This analysis should work. However, another thing to note is that, as with Ippolito's original denotation for concessive *still*, this is now a denotation for a FSP that does not incorporate the focus semantic value or *C* to utilize its focus sensitivity. So while this denotation works, and is not even very oddly specified, it is a very odd denotation for an FSP. This lack of interaction with focus is easily remedied, but the remedy comes at the cost of a differently odd specification. Both propositions must be arguments

in order to match the syntactic facts, but q can be drawn from C by effectively limiting the focus semantic value to propositions that are equal to q. This is incorporated in the following third version of a denotation for *even*.

(90) $[\![even_{concessive}]\!]_{v3} = \lambda p \lambda q : \exists r \wedge r \in C \wedge ((r \cap p) <_{likely} (r \cap \neg p)).p \wedge q$

   Where $C \subseteq \{q\}$

The denotation and restriction in (90) does bring C back onto the field, but in a way that does add needless pieces. Given that two propositions are required syntactically, and both of them are referenced in the presupposition and the assertion, as I showed in (88), including a reference to C does not mean that we can include reference to fewer propositions. Instead, in order to reference a proposition from C, we need to effectively define C as being equivalent to one of those propositions. This is not necessarily in line with any of the previous discourse restrictions on C that I have proposed for any FSPs I have analyzed. Perhaps this is an argument that 'the set containing the proposition said next' should be an accessible object in the discourse in the same way that something like a speaker's discourse commitments are, but I am not familiar with any other evidence for such a set. That is, I do not know of any linguistic phenomena that require referencing the following sentence or proposition. Furthermore, it seems unlikely that the restriction for C should be able to access q if it is written as is. Recalling the discussion in the previous chapter about whether it is worth eliminating C by writing the restriction into the denotation directly, this would eliminate some of the redundancy in (90) but not all. Regardless, this denotation will be slightly redundant if it includes reference to *even*'s focus sensitivity.

Unlike the examples of FSPs in the previous chapter, with *even* we do not want to extend this updated analysis back to all cases of *even* with constituents smaller than the proposition focused. For starters, there is the syntactic difference mentioned before, where concessive *even* requires two propositions locally, but "regular" *even* does not. And I have already established the other difference where *even* is typically acceptable out of the blue, with minimal presupposition accommodation, but concessive *even* is totally unacceptable. I take both of these pieces to show that concessive *even* is about the interaction of two specific propositions, and *even* with smaller constituents focused is

not. As a result, their presuppositions work in different ways and are currently incompatible. The concessive *even* presupposition as written above is that $q \wedge p$ is less likely than $q \wedge \neg p$. The typical presupposition for *even* is that p is less likely than other members of C. Recall that C is a subset of the focus semantic value of p, so we should expect an example set like the following one for *even* with a smaller constituent focused.

(91)   Even [John]$_F$ failed the test.

$$[\![\text{John failed the test}]\!]^f = \left\{ \begin{array}{l} \text{Erica failed the test.} \\ \text{Rowan failed the test.} \\ \text{Emily failed the test.} \\ ... \end{array} \right\}$$

Looking at the example members of C in (91), you could argue that if other people are failing the test, it is more likely that John failed the test just in terms of it being a failable test. However, consider this hypothetical situation. Erica and John are both likely to fail any test, Erica more so than John. So if Erica fails, John probably did too. Rowan and Emily are very unlikely to fail. In the event that Erica and John both fail the test and Rowan and Emily both pass, it is not felicitous to say *Even **John** failed the test*, even though there exists some proposition q in the focus set (*Erica failed the test*) such that $q \wedge p$ is less likely than $q \wedge \neg p$. So directly extending the presupposition from concessive *even* back to other uses of *even* makes incorrect predictions, but at the same time, this kind of conjunctive presupposition is needed to incorporate how concessive *even* incorporates its two propositions. Furthermore, the discourse restriction I proposed for concessive *even* (or concessive *still*) should not be extended back to all uses of *even*. The fact that typical uses of *even* work out of the blue means that their C cannot be restricted to only include propositions that are in the CG or on the Table, that are syntactically local, or that are already overtly in the discourse at all. In (91), I would expect none of these propositions to be overt in the discourse anywhere. Instead, the knowledge the interlocutors need is something along the lines of 'out of the propositions in C, p is less likely to be true than the others are'. And finally, to move on to the assertion, as I have showed that the assertion for concessive *even* asserts both p and q, this relies on two propositions.

With lower focus, *even* only has access to the one specific proposition.

It is not immediately clear why the typical use of *even* does not seem to be appearing with proposition level focus. Given that they take a different number of arguments, I do not expect a problematic ambiguity would result if both could interact with proposition level focus, so there is no immediately obvious reason why the typical use of *even* could not also appear with proposition level focus. Consider the following data.

(92)   This cooking attempt was a disaster. The meat is burned... The sauce is overly salted...

     a. And the microwave meal even exploded when we gave up and tried that instead.

     b. And even the microwave meal exploded when we gave up and tried that instead.

In (92), I have attempted to create a case where *even* appears with proposition level focus, but different from concessive *even* or concessive *still* in that it is not a conjunctive case. The goal was to create the reading that out of all of the propositions listed, *p* occurred and was least likely, which I do seem to get from this data. However, it is not clear that this data could not be explained as focusing smaller constituents. In (a), perhaps the microwave meal was more likely to just over or undercook, rather than totally explode, and in (b), perhaps other things seemed more likely to explode than the microwave meal. Or, it could be that *p* is unlikely *because* of these factors. This is difficult to tease apart. Given that I do not have any tests to distinguish what is happening in this data, I will leave it for future research and claim decisively that there may or may not be cases of the typical use of *even* interacting with proposition level focus, but this is not the focus of this chapter so I will not worry about it further.

Given that it shows differences from typical *even* and requires a totally distinct denotation, concessive *even* is already slightly problematic for the overarching theory from the previous chapter, and it might make sense to just consider this one as something lexicalized. So what does this say about the FSP *even* in general? The prediction from Chapter 3 is that FSPs should simply be able to interact with any size constituent focused, including propositions and smaller constituents both, and that they should then act the same in all cases. Discourse restrictions may be easier to spot

when the proposition is focused, as that creates a very unrestricted focus semantic value, but they should apply just the same in cases with smaller constituents focused. It is not predicted that FSPs should have an alternate version for when different constituents are focused. Far from *even*'s usual status as a prototypical FSP, in this case *even* stands out as being slightly irregular, but I lean it is not so irregular as to constitute a counter example to this overarching theory.

4.4 Interim conclusions and related questions

In this chapter, I stepped through an analysis of aspectual particles in comparatives. Initially they look like a degree construction where a typically event-related expression contributes, counter to the direction of the analysis in Chapter 2. However, my analysis links these uses of *yet* and *still* to what has been observed by Ippolito (2007) and called concessive *still*. Following the lead of that paper, I use the tools developed in Chapter 3 to propose a modified analysis that takes the appearance of *still* in comparatives to simply be another instance of concessive *yet*, and analyses all of these uses as FSPs interacting with proposition level focus. I extend the same analysis to *yet*, and then explore what this means for *even*, which wraps up slightly less neatly than the "aspectual" particles do.

At this time, none of the data that I have analyzed presents a situation where the analysis must be one where an event construction is built up into a degree construction. As is, these analyses support the conclusion that there is a directional relationship between degrees and events. Degree constructions can be built into or be arguments of event constructions, but there is currently no evidence of the reverse relationship.

One small factor that this analysis has not addressed is the fact that *still* and *yet* can co-occur in the same sentence without sounding repetitive.

(93)   I tried to straighten the painting several times, yet still it hangs crooked.

This analysis does not predict that they should not be able to co-occur, but it would make sense that it would at least sound repetitive since they contribute the same thing. To also bring up some data that looks related but has not been covered, *still* and *yet* can appear with some adjectives

outside of a comparative. However, they do not work with all adjectives outside of a comparative. Compare the following sentences.

(94) Danny painted their kitchen two colors, and their living room {yet / still} different colors.

(95) * Danny painted their kitchen bright colors, and their living room {yet / still} bright colors.

(96) ? Danny painted their kitchen two colors, and their living room even different colors.

The gradable adjective *bright* is not acceptable here in (95), but *different* is in (94). Given that *different* is an odd adjective, it seems likely that something else is going on here involving that. This data indicates that there is more to be done with *still* and *yet*, but it may not totally parallel *even* in this case, as (96) shows *even* to be unacceptable in the same place. It is clear there is more work to be done on this topic, even as it wanders away from the overarching topic of this dissertation.

CHAPTER 5

CONCLUSION

5.1 Overall contributions

In this dissertation, I have investigated a wide variety of topics, and wandered through more subfields than any one of these phenomena would have suggested were related. These overarching subfields within semantics included degree semantics, event semantics, focus sensitivity, and discourse. In addition to linking some of these compositionally, I also worked on formalizing the theory of how they might be linked in terms of "context". As a result, this work does not dive too deeply into any one of these topics, but rather it examines what conclusions we can draw from studying their interactions. The fewer the variables in the experiment, the better controlled it is, and that is an argument for not typically spreading research across subfields. However, studies like this one are invaluable for removing artificial divides that we have created for research convenience. Our goal is to model what a speaker of a language knows and computes, and in theory the speaker can involve all of these subfields at once, and in much more complex conversation.

To break down the conclusions of this dissertation, it can be split into two main theoretical interactions. First I will discuss my conclusions for the interaction of degrees and events. Second I will discuss my conclusions for the interaction of focus, discourse, and context. And finally, I will wrap up by discussing what this dissertation did *not* answer.

5.2 Between degrees and events

The first major interaction this dissertation addressed was the relationship between degree constructions and event constructions, providing analyses of some English data to draw conclusions. Chapter 2 dealt with data that evidenced a link between degree constructions and event constructions. I laid out data showing an ambiguity with *more*, but also with several other adjectives and expressions, where each expression allowed a degree addition reading or an event summing

reading. This ambiguity was robust, appearing in the same way with multiple expressions, and with only mild syntactic variation. On the basis of this data, and some other evidence, I proposed a compositional analysis that assumed the degree addition reading to be the base, and constructed the event structure by building from that. To start with, I argued that all uses of *more* should be analyzed as a differential *more*, rather than assuming two different *more* denotations. This introduces questions about what silent degree arguments do we have and how do they work, but it also directly introduced degree addition into the denotation for the comparative morpheme, and from there, I proposed a morpheme that interacts with degree addition to create event summing. At this point I could bring this analysis back to some of the other additive expressions, focusing on the adjectives for syntactic simplicity. Extending my analysis from the comparative to additive adjectives supported my proposal of a morpheme that applies to syntactically diverse constructions as long as they fit the semantic requirement of incorporating degree addition. This does require an interesting and nonstandard semantic type for some of these adjectives, but these would hardly be the only adjectives that act in unique ways.

What were the main takeaways of this chapter's analysis in terms of the theory itself? This provided evidence that there is a link between degree constructions and event constructions, and specifically a directional one where degree constructions build to event constructions. This opens up questions as to whether this is the only direction possible in this relationship, or whether the link between degree and event constructions is more varied.

I continued to investigate this topic and these new questions in Chapter 4, with other data that looks to bridge these two subfields. Other analyses do exist that link degree and event semantics, but here I focused on related data, staying with the comparative. Specifically, I brought up data involving the comparative where it initially looks like an expression typically associated with event semantics is contributing to a degree interpretation. This is iteration in comparatives, and aspectual particles *still* and *yet* in comparatives. This is by no means to say that this is the sum of the related data and I can draw all the meaningful conclusions from what I have here, but rather this data naturally follows the focus on comparatives from Chapter 2, and ostensibly looks to show the

opposite direction of analysis. For the iteration, I briefly reviewed Beck's analysis indicating that it is better analyzed as an event construction, even if it looks like a degree construction. I then took that lead, and determined that while aspectual particles in comparatives are degree expressions overall, *still* and *yet* are contributing something different and unrelated. That is, they just happen to appear in comparatives. This is not evidence in favor of a relationship where event constructions compositionally build to degree constructions. Absence of evidence is not evidence of absence, but surveying all of the possible counter examples is out of the scope of one dissertation, and the goal of countering immediately obvious data was achieved.

So what do we want to take away from this focus? There is clearly space for further research at the intersection of degree semantics and event semantics. One directional relationship has been established, but are there other routes between these two constructions? If speakers have one way to build a degree construction into an event construction, they could have more than one. Comparatives certainly are not the only type of degree construction, so it seems entirely possible for a different morpheme to compositionally build a different degree expression into an event expression. In addition, I have not proved the absence of any directional relationship in the other direction. The slim body of related research does not suggest that a structure that takes an event construction and builds it compositionally into a degree expression is likely, but its possibility is not disproven.

5.3   Between focus, discourse, and context

The second major interaction this dissertation addressed was how focus semantics relies on the model of the discourse and what we mean by "context", again analyzing English data to draw conclusions about what this relationship must look like. Chapter 3 introduced data that looks morphologically related to the data from Chapter 2, but impressionistically dealt with adding things to lists in the discourse rather the numerical or mathematical addition. After making this analytical link, however, it became clear that the best analysis of this data grew from the data that involved *also* instead of the morphologically linked *more* or *addition*, and an analysis relying on

focus sensitivity makes sense. I proposed an analysis where discourse *also* was actually simply an aspect of typical *also* that was previously not discussed. I provided arguments in favor of it being the typical use of *also* interacting with a focused proposition, provided that we formally define what it means for the focus semantic value of something to be "contextually restricted". In terms of this formal definitions, I proposed that the objects in the discourse themselves can be the contextual restrictions on the focus semantic value. I worked mainly with the Table model of discourse, as it makes clear predictions for what objects exist that interlocutors can access, but this theory also then provides arguments for considering categories for interlocutors to track on the basis of what contextual restrictions we see, which I will return to momentarily. So in the case of *also* and the other data I began this chapter with, the discourse addition effect comes from how *also* presupposes the truth of another proposition from the focus set of alternatives, which is here restricted to include only propositions that were already said in the discourse. Thus functionally describing list environments. To take this one step further, I showed that the same discourse restriction applied to all uses of *also*, indicating that current analyses of FSPs may be missing discourse restrictions that become more clear when looking at uses with otherwise unrestricted proposition level focus.

This made the prediction that other FSPs could appear with proposition level focus, and may have discourse restrictions that previous analyses have missed, given that they examined cases where the focus semantic value was already quite restricted based on where alternatives were first generated. I immediately supported this analysis with data involving *only*, which confirmed that this prediction bears out. This analysis also brings back the point that this analysis provides an argument for including a category in the discourse if the focus alternatives being considered are limited to that category. In the case of *only*, a few options exist. The most parsimonious ones only involve including goals like the domain goals proposed by Roberts (2004, 2018), but the analysis that is least complicated in terms of the formalism required gains this clarity by proposing we add the notion of impediments. Given that there are multiple options that worked with this data, this was not a clear-cut case for arguing that impediments must be a notion that interlocutors can access with regards to tracked goals, but I also supplied some data suggesting that the notion would be

useful at least in analyzing the implicature of *but*. Analyzing *only* made it clear also that *only* and *also* are restricted by the discourse in different ways, meaning that this kind of restriction must be lexically specified.

To take a moment and highlight the important parts here, Chapter 3 made several contributions. First, I provided an analysis showing that the proposition as a whole can be focused in an informative fashion. My analysis showed that proposition level focus would cause issues with some of the typical FSP denotations unless we formally define how the context and the discourse restrict the focus semantic value, and I proposed a formal method for doing so based on the discourse structure. While I wrote this using Rooth's C notation, this method is compatible with removing C from the formalism and simply specifying the limitation on $[\![\alpha]\!]^{\mathrm{f}}$ within the denotation lexically. While I have no evidence to suggest that every FSP would need to be rewritten to include a contextual restriction via objects in the discourse, this shows that at least some of them would be more accurately analyzed in this way. And finally, I showcased how this analysis allows us to in turn investigate the structure of the discourse as well, as the case of *only* provided an argument for adding at least goals, if not also impediments, to the list of what interlocutors must be tracking in a discourse.

This analysis came into play in Chapter 4 as well. I extended Ippolito's analysis of concessive *still* as a FSP to uses of *still* in comparatives, and then reanalyzed it in the framework I proposed in Chapter 3 in order to deal with some otherwise problematic data. From there, I extended Ippolito's reasoning to defend the interpretation of *still* in its different uses as all involving focus sensitivity to uses of *yet* as well, and correspondingly extended the same analysis. This successful extension added support for the framework I proposed in Chapter 3. However, this use of *still* and *yet* is very similar to *even*, and discussing how *even* interacts in these cases of proposition level focus brought up weaker points in this analysis. Specifically, this comparable use of *even* has different syntactic properties and a working denotation for it necessarily does not work for the typical use of *even* with lower focus. This is counter to the prediction made in Chapter 3, which predicted that a FSP should (unless blocked for some other reason) be able to interact with proposition level and sub-proposition level focus just the same. That is, there is no reason why a different denotation should be needed for

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a different sized focused constituent. That said, *even* does not pose a problematic counter-example to this theory, in that lexicalized or idiomatically different versions of things exist all the time, and the specificity of *even* looks like that. Overall, more data is in support of this hypothesis than against it.

Again, to sum up the takeaways, the main contribution of this section was the overarching reanalysis of the interaction between focus and context. I have proposed a formal way to define contextual restrictions, at least for focus interpretation, which allows us to make testable hypotheses, precisify our understandings of FSPs, and explore what objects and notions make up the discourse.

5.4 Unanswered questions

First, I began this work with the intention of connecting various places in language where we see things that can be characterized as "addition", and as I worked I discovered I was migrating away from that overarching topic. While the analyses here do satisfy me in terms of dealing with the data and the theory, the morphological link between the data in Chapter 2 and the data in Chapter 3 does not fall out from what I have here. As of now, I have no explanation for this link, so that is left for future research.

Second, while I have formalized contextual restrictions for FSPs, that is not the only place "contextual restriction" appears. For starters, focus sensitive expressions are not the only place where focus is relevant, as I briefly glossed when introducing Rooth's theory in Chapter 3. Surely context matters for other uses of focus, but given that my analysis embedded this restriction lexically, this might present an issue for how focus relates to things that are not rooted in a single morpheme. In addition, much like the lure of a "pragmatic wastebin" for dealing with difficult points of an analysis, "context" is easy to call on to hand wave away some small problems. Is this a method that we can use to resist this habit via formalizing exactly how "context" works in the semantics?

In conclusion, in this dissertation I have asked many questions, some of which I have even answered. These questions investigated the relationship between degree constructions and event constructions, and the relationship between focus and the discourse structure. I have shed some

light on these things, but I consider the paths I have opened for further research to be an important contribution as well.

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