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Another take on nonrestrictive adjectives

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ABSTRACT OF THE THESIS

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This thesis examines the compositional and information-structural properties of nonrestrictive adjectives, which are used not to identify referents but to provide additional information about them. By considering the interaction of nonrestrictive adjectives with non-intersective adjectives like *other*, I argue that some nonrestrictive adjectives must take scope over the DP they modify, following Potts (2005). I extend the analysis to account for nonrestrictively modified quantifier phrases, using an anaphoric semantics in line with recent approaches to nominal appositives (e.g. Nouwen 2014), whereby nonrestrictive modifiers are anaphoric to the entity they modify. Additionally, I document properties of nonrestrictive adjectives concerning their effect on discourse and their projection from embedding contexts. The data I present provide additional support for Esipova's (2019) claim that nonrestrictive adjectives behave like the gender presuppositions of pronouns, and that they do not fit neatly into existing categories of not-at-issue meaning, such as standard presuppositions or conventional implicature.

The thesis of Kalen Wei Chang is approved.

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Chapter 1

Introduction

Canonical uses of adjectives are restrictive, where they help narrow down the set of potential referents by specifying a subset of the nouns they modify, as in (1). In this example, *my sick dogs* refers not to all of the speaker's dogs, but the subset of the speaker's dogs which are sick.

(1) I have five dogs, but two aren't feeling well. I need to take my sick dogs to the vet.

If adjectives were only used for identifying nominal referents, then uttering (2a), where all of the speaker's dogs are sick, would be using more words than necessary, a violation of the Gricean Maxim of Manner, since *my sick dogs* and *my dogs* are co-referential. But unnecessary uses of adjectives like in (2a) are commonly uttered, and they seem to be serving a different purpose. Rather than being used to identify referents, it contributes information about the referent, such as conveying that the speaker's dogs are sick, and that this is relevant to why they need to be taken to the vet. These uses are nonrestrictive, and there is no consensus on how nonrestrictive adjectives (NRAs) should be analyzed, or whether their compositional semantics differs from restrictive adjectives at all.

(2) I have five dogs, but they aren't feeling well.

   a. I need to take my sick dogs to the vet.

   b. I need to take my dogs, who are sick, to the vet.

Nonrestrictive adjectives are often paraphrased and felt to be synonymous with appositive relative clauses (ARCs) like (2b). Based on this similarity, some linguists have analyzed nonrestrictive adjectives as covert DP-level modifiers, in effect giving the adjectives scope over their hosting descriptions (e.g. Potts 2005, Leffel 2014). However, nonrestrictive adjectives can modify all kinds of quantificational DPs, while appositives are much more restricted. This led Morzycki (2008) to an alternate analysis leaving NRAs in-situ where they contribute information to a second, supplemental semantic dimension about the maximal set of referents satisfying the modified noun. There are yet other accounts which treat nonrestrictiveness as a pragmatic epiphenomenon, instead giving an ordinary intersective compositional semantics (e.g. Esipova 2019).

After briefly summarizing previous analyses of nonrestrictive adjectives, I argue that at least some nonrestrictive adjectives must take scope over the DP they modify, based on interactions with non-intersective adjectives like *other*. While (3) presupposes that at least some of the dogs washed yesterday were white, (4) does not. In addition, (4) entails all of the dogs that were not washed yesterday are white. On the other hand, in (3), the dogs that were not washed yesterday includes white dogs but could also include dogs of other colors.

(3) I washed some of the dogs yesterday, and today I'll wash the other white dogs.

(4) I washed some of the dogs yesterday, and today I'll wash the other, WHITE dogs.

I will show how interpreting a nonrestrictive adjective out of the scope of its host DP gives both the proper presupposition for *other* and the proper nonrestrictive interpretation of the adjective. While these data cannot be accounted for by most of the previous analyses I review, it is broadly consistent with Potts (2005). His analysis can be extended to account for additional cases, specifically modified quantifier phrases, using an anaphoric semantics more in line with recent approaches to nominal appositives (e.g. Nouwen 2014). After an informal presentation of my proposed analysis, I provide a compositional fragment analyzing nonrestrictive adjectives, based on Charlow's (2014) compositional dynamic semantics.

Then, I document properties of nonrestrictive adjectives concerning their effect on discourse

and their projection from embedding contexts. I show that they do not fit neatly into existing categories of not-at-issue meaning, such as standard presuppositions or conventional implicature, and bear resemblance to both in different ways. On the one hand, nonrestrictive adjectives seem to contribute a similar kind of meaning to appositives – and this is reflected in the similar compositional analyses – but do not seem to project as universally as appositives do. On the other hand, they do not impose the same constraints on the common ground as standard presuppositions, but display similar projection patterns. Ultimately, the data I present provide additional support for Esipova's (2019) claim that nonrestrictive adjectives behave like the gender presuppositions of pronouns. Finally, I conclude by presenting open questions regarding nonrestrictive adjectives and areas that need further research.

Chapter 2

Previous work

Previous research on nonrestrictive adjectives can be grouped into two broad groups: pragmatic accounts and semantic accounts. Pragmatic accounts attempt to derive nonrestrictive inferences via principles of conversational reasoning, whereas semantic accounts propose some conventionalized mechanism to derive such inferences.

2.1 Pragmatic accounts

In English, there is no obvious conventional way (morphological, syntactic, or prosodic) to mark the (non)restrictiveness of adjectives, unlike the prominent intonational break of nonrestrictive relative clauses.[1] In addition, in many cases like (5) below, the nonrestrictive reading entails the restrictive one. This has lead some to claim that nonrestrictive inferences are pragmatically derived, and that the semantic system only derives the restrictive reading.

(5) I just finished writing my long and tedious manuscript.

a. restrictive: I just finished writing the manuscript of mine which is long and tedious.

b. nonrestrictive: I just finished writing my one and only (salient) manuscript; it is long

[1] While I later discuss some intonational patterns which correlate with nonrestrictiveness in some cases, it is important to note that the intonation does not occur with *all* nonrestrictive adjectives.

and tedious.

Schelnker (2005) proposes a rule, *Minimize Restrictors!*, meant to predict when an adjective in a definite description is deviant. He claims that *the A B* is deviant if *A* can be removed without changing the grammaticality, the reference of *the A B*, or the pragmatic effect of the description. Adjectives which do not do any restricting work (nonrestricting adjectives) do not change the reference of *the A B* vs. *the B*, but they have pragmatic effects. Schlenker claims they must be relevant, and thus provide additional information relevant to the conversation.

Following Schlenker, Esipova (2019) claims there is no compositional semantic distinction between restrictive and nonrestrictive interpretations. Rather, she argues that what I have called the nonrestrictive inference of a sentence – e.g. in (5), that my manuscript is long and tedious – arises as a pragmatic inference whenever a speaker communicates that they have intentionally used an unnecessary modifier; that is, when a speaker uses a modifier knowing full well that it does not change the truth value of the sentence it is in.

An obvious question for accounts of this kind is how speakers manage to communicate such specific metalinguistic information. Presumably, by hypothesis, the process is not conventionalized, since this is intended to be an alternative to conventionalized implicature analyses. But at the same time, adjectives can be construed to be nonrestrictive even when listeners are a priori unaware of the semantic equivalence between the sentence and its modifier-removed alternative, as in (5). It is not clear what general principle of rational communication would lead an addressee to believe the speaker is being needlessly verbose if they do not already have enough information to know that the verbosity is needless. Of course, in these circumstances, ordinary Maxim of Manner reasoning would put an opposing pressure on the rational addressee to assume, absent contravening knowledge, that the speaker is not being intentionally wordy.

Esipova makes use of the fact that there are many reasons why a modifier might turn out to be vacuous in context. Faced with an utterance in which modifier-vacuity has been signaled, the addressee is presumably free to assume the speaker is conveying anything (or at least, the weakest

inference) that would entail the truth-conditional equivalence of the modifier-containing and modifier-less versions of the uttered sentence. This is what leads to conditionalized nonrestrictive inferences in examples like (6). However, this freedom also overgenerates in ordinary cases such as (7).

(6) If all philosophers ask questions like this, I don't want any obnoxious philosophers at my talk next week. (Esipova 2019)

   a. correct inference: If all philosophers ask questions like this, they are all obnoxious.

(7) Paige didn't bring her cute puppy.

   a. correct nonrestrictive inference: Paige's puppy is cute

   b. predicted (incorrect) possible inference: if Paige didn't bring her puppy, it is cute

Nevertheless, Esipova (2019) provides a detailed and valuable study on the projection properties of nonrestrictive adjectives. As I will discuss later in Section 6, her conclusion that nonrestrictive adjectives behavior in discourse resembles gender presuppositions holds, even when we expand the range of nonrestrictive adjectives to be examined.

2.2 Semantic analyses

In light of the systematic restrictive/nonrestrictive ambiguity in adjectives, several authors have sought semantic derivations of the contrasts, such as Potts (2005), Leffel (2014), and Morzycki (2008). I will describe and compare these three analyses, providing a rough sketch of each.

Potts (2005) treats nonrestrictive adjectives just like appositives, giving them scope over the DP they modify. Nonrestrictive modifiers (adjectives and relative clauses) then serve as functions from the modified entities to truth values in a secondary dimension of meaning, as shown in (8). However, he predicts that nonrestrictive adjectives, like appositives, cannot modify quantifier phrases, since nonrestrictive modifiers are only able to take type e arguments. This is not true

for adjectives, as shown in Morzycki (2008) and later in Section 4.[2] Below is a rough sketch of Potts' analysis, using the bullet to separate at-issue from not-at-issue content, for both semantic content and types.

(8) Chuck's lovely vases

$\textbf{vases-of}(\textbf{chuck}) \bullet \textbf{lovely}(\textbf{vases-of}(\textbf{chuck})) : e \bullet t$

Leffel's (2014) analysis provides a similar structure to Potts', with the nonrestrictive adjective taking the modified DP as an argument. However, rather than interpreting the nonrestrictive adjective outside of the DP, he claims that nonrestrictive adjectives are already outside the DP, and the determiner moves to derive the correct word order (which reconstructs in the original position for proper interpretation). This means that he predicts all nonrestrictive adjectives must appear higher in the tree than (e.g. in English, to the left of) restrictive adjectives. Adjective order is discussed later in Section 3.2.

(9) $[_{\text{DP}}\ \text{D}\ [_{\text{DP}}\ \text{AP}_{\text{NR}}\ [_{\overline{\text{D}}}\ t_{\text{D}}\ [_{\text{NP}}\ \text{AP}_{\text{R}}\ \text{NP}]]]]$

Morzycki (2008) focuses on quantifier phrases with nonrestrictive adjectives, which generate different inferences from nonrestrictively modified referential phrases. Nonrestrictive adjectives in quantifier phrases generate a sum-level inference (Leffel 2014), which means the entire set denoted by the noun is in the extension of the adjective, as shown in (10). For him, a nonrestrictive adjective modifies the noun directly (not the DP), in all cases predicated on the maximal set of entities which have the property of the noun, within the contextually relevant domain C. This is shown in (11), with an example in (12).

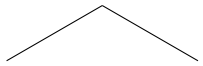
(10) Few lazy senators voted for the bill.

nonrestrictive inference: the senators are lazy

(11) Expressive Predicate Modification (Morzycki 2008)

[2] In fact, this is not true for appositives either (Arnold 2004, Del Gobbo 2007).

$\beta \bullet \alpha(\Sigma\beta) : (e \to t) \bullet t$



$\alpha : e \to t$ $\qquad$ $\beta : e \to t$

where the modifier is α and the modified expression is β; $\Sigma\beta$ picks out the maximal plural individual in the extension of β.

(12) Every [unsuitable (= α) word$_C$ (= β)] was deleted.

$\mathbf{every}(\lambda x.\, \mathbf{word}\, x \wedge x \in C)(\mathbf{deleted}) \bullet \mathbf{unsuit}(\Sigma(\lambda x.\, \mathbf{word}\, x \wedge x \in C)) : t \bullet t$

inference: every word is unsuitable

His analysis is able to handle quantifier phrases with any quantifier. This is because the inference it generates does not depend on the quantificational force of the quantifier, which is in line with the data: all quantifier phrases can lead to sum-level inferences, which are predicated on the maximal restrictor set and ignore the kind of quantifier.

Chapter 3

The scope of non-intersective adjectives

Many non-intersective adjectives display interesting scopal interactions with other adjectives in the same DP. If an adjective *Adj* is intersective, then *X is an Adj N* entails *X is Adj* and *X is an N*. On the other hand, non-intersective adjectives have meanings which are dependent on the noun they modify, and do not exhibit the entailment pattern shown by intersective adjectives (e.g. Siegel 1967).

In this section, I examine the interactions these non-intersective adjectives have with other adjectives in the same DP by looking at examples with *other*. I show that under certain readings, adjectives that follow *other* must be interpreted as nonrestrictive. While my examples use *other* for clarity, the properties I describe apply to other non-intersective adjectives as well, which I show at the end of this section.

Let us start by examining the properties of *other* to formulate a simple denotation. *Other* is often used to convey to listeners which entity or entities they are referring to from a given set by contrasting what the speaker is referring to with previously mentioned or contextually salient entities, which I call the antecedent of *other*. In the following examples, I give an explicit linguistic antecedent for *other* to create contrast with, but *other* can take its antecedent from the extralinguistic context.

As shown in (13), *other* requires an antecedent which bears the property denoted by its sister.

In this example, the antecedent is *my little poodle*, which bears the property of *dog*, but not *cat*, explaining why it is infelicitous to say *my other cat* in this context.

(13) Over there is my little poodle. My other {dog/#cat} is with my parents right now.

I assume, following Kamp (2001), that *other* is anaphorically linked to this antecedent and presupposes that the antecedent has the property of its sister, P. *Other* also requires that its subject and antecedent are disjoint, which I represent with $\neq$.

(14) $[\![\text{other}_i]\!]^g = \lambda P : P(g_i).\, \lambda x.\, P(x) \wedge g_i \neq x$

With definite DPs, such as *the other dogs*, it may seem that the existence of a disjoint antecedent is presupposed. The reason disjointness is asserted and not presupposed becomes clearer with indefinites, such as *two other dogs*. In (15), the discourse is felicitous even if there are only two dogs, not four. B's denial of A's assertion involves B denying that the dogs John washed were disjoint from the first group, and *two other dogs* does not presuppose the existence of a third or fourth dog.

(15) A: John washed these two dogs yesterday, and he washed two other dogs today.
B: No he didn't, today he washed the same dogs as he did yesterday!

It follows from the denotation in (14) that if a restrictive adjective appears in the first argument of *other*, the antecedent will be presupposed to satisfy that adjective, as in (16). In this example, *the other small book* presupposes that the antecedent book is small, and this presupposition is satisfied by the information given in the first half of the sentence. On the other hand, because the antecedent is small, it is infelicitous to use *the other large book* here. This is explained if the first argument of *other* is *small/large book*, not just *book*, and thus the adjective contributes to the presupposition in addition to the noun.

(16) *(Scenario: I give you two small books and two large books, and point to a small book.)*
Leave that small book on the table, and put the other {small/#large} book on the shelf.

However, with the right intonation, cases like (17) or (18) are also felicitous, where an adjective (here, *larger* or *white*) modifying the noun modified by other does not describe the antecedent. The relevant intonational cues seem to involve a prosodic break before the relevant adjective, and stress on that adjective. I discuss the importance of this intonational pattern later in Section 3.1.

Because the examples are acceptable despite the antecedent not being the extension of the adjective, the adjective must not be part of the presupposed predicate. Specifically, in (17), *the other, larger book* does not presuppose that the antecedent book is a "larger book", but merely that it is a book.

(17) *(Scenario: I give you a small book and a large book, and point to the small book.)*
Leave that small book on the table, and put the other, LARGER book on the shelf.

(18) I washed the black dogs today, and I'll wash the other, WHITE dogs tomorrow.

I will call adjectives like this "contrasting", i.e. adjectives between *other* and the noun they modify, but which do not describe the antecedent and thus do not contribute to its presupposition. Note that nouns cannot be contrasting in this sense; in the infelicitous example (19), *the red umbrella* is not sufficient to satisfy the presupposition of *the other red book*, since (19) presupposes that there is a red book, not just any red object.

(19) # Leave the red umbrella on the table, and put the other(,) red(,) BOOK on the shelf.

Crucially, contrasting adjectives do not merely commute with *other*; they are necessarily interpreted nonrestrictively. In other words, they are taken to apply to the entire class of objects in the extension of the *other* NP. For instance, (20a) cannot be used to refer to those books which are both larger than and different from the antecedent; instead it commits the speaker, infelicitously here, to all of the other books in the office being larger than the one they picked up. Note that an ordinary restrictive reading like (20b) is also grammatical; however, it is also infelicitous because it is contradictory by assuming that the antecedent book is larger than itself.

(20) *(Scenario: You enter my office with books everywhere. I pick up an average-sized book. You notice there are only two books larger than the one I picked up but many smaller ones.)*

a. # Take this book home, and put the other, LARGER books on the shelf.

b. # Take this book home, and put the other larger books on the shelf.

Similar patterns can be observed with other non-intersective adjectives whose semantic contributions are affected by the phrases they modify, such as superlatives, ordinals, and exclusives like *only*. Example (21) contains a minimal pair, differentiated only by intonation. In the first example, with no pauses, *utterly useless* is restrictive and the VHS Pat bought was the last utterly useless one, with the possibility of some non-useless VHS tapes remaining at the sale. In the other example (with pauses), *utterly useless* is nonrestrictive and the VHS Pat bought was the last one overall.

(21) a. Pat bought the last utterly useless VHS tape from the garage sale.

b. Pat bought the last, utterly USELESS, VHS tape from the garage sale.

I have shown that some adjectives cannot be interpreted within the scope of their DP, and I will discuss how to handle this issue in the following sections. But first, I would like to comment on the relationship between these examples and pragmatic accounts of nonrestrictive adjectives.

Some of the examples I present display interesting entailment patterns between the two readings. In (22) and (23), the nonrestrictive reading entails the restrictive one. For example, in (22), if it is true that I met the only dean, it is also true that I met the person who is a dean and respectable. In these cases, it is possible to say that the adjective is always restrictive, and that the nonrestrictive reading happens to be true if the context is right (Esipova 2019) or that the nonrestrictive reading is the result of strengthening the restrictive reading in certain contexts.

(22) I met the respectable dean of our college at the gala yesterday.

a. restrictive: I met the dean who is respectable (perhaps there are other deans)

b. nonrestrictive: I met the one and only dean; she is respectable

(23) Pat bought the last(,) utterly useless(,) VHS tape from the garage sale.

a. restrictive: Pat bought the last VHS tape which was useless (perhaps there are more VHS tapes)

b. nonrestrictive: Pat bought the last VHS tape; it was useless (there are no more VHS tapes)

However, there are cases in which such a pragmatic account is impossible due to the lack of entailment patterns. The examples with *other* above, such as (24), and with *second* below in (25), crucially do not display the entailment patterns just described. In (24), the restrictive interpretation commits the speaker to washing the intersection of dogs not washed today and white dogs, but says nothing about dogs of other colors. In addition, the dogs washed today are white. On the nonrestrictive interpretation, all the other dogs (all the dogs not over there) are white and being washed tomorrow. And in (25), a nonrestrictive interpretation means that the performer will now play Beethoven's second piece for bassoon, which happens to be beautiful. A restrictive interpretation only guarantees that the piece she will now play is the second beautiful piece, which allows the possibility of non-beautiful works composed before it, and it is possible for the performer to be playing Beethoven's third or fourth piece for bassoon overall.

(24) I washed those dogs over there today, and I'll wash the other(,) white(,) dogs tomorrow.

a. restrictive: I will wash the dogs that are not over there and white (but there may be dogs of other colors not washed); the dogs over there are white

b. nonrestrictive: I will wash all the dogs not over there; they are all white

(25) The performer just played the first piece Beethoven ever wrote for bassoon. She will now play his second(,) absolutely beautiful(,) solo piece for bassoon.

a. restrictive: the piece she will now play is his second beautiful bassoon piece, but possibly the fourth bassoon piece overall

b. nonrestrictive: the piece she will now play is his second bassoon piece, and it is beautiful

In both these examples, neither the restrictive reading nor the nonrestrictive reading entail the other, so the nonrestrictive reading cannot be reduced to a special subcase of the restrictive reading. Thus, the nonrestrictive reading must be derived independently in the semantics.

There are two crucial properties of contrasting adjectives that need to be captured in any analysis. As shown in (20a), repeated below in (26), and similar examples, contrasting adjectives need to i) escape the semantic scope of *other*, and ii) be interpreted nonrestrictively. That is, *larger* does not and cannot describe the antecedent book, and *all* non-antecedent books must be larger than this antecedent.

(26) *(Scenario: You enter my office with books everywhere. I pick up an average-sized book. You notice there are only two books larger than the one I picked up but many smaller ones.)*
Take this book home, and put the other, LARGER books on the shelf.

An analysis similar to Potts (2005) or Leffel (2014) can account for these two properties. In effect, nonrestrictive adjectives scope over their host DP and take it as an argument, and return a two-dimensional result: one dimension contains the DP argument unchanged, and the secondary component says the DP has the property of the adjective.

While only some examples (e.g. those with *other*, *second*, etc. + a contrasting adjective) require a special analysis for deriving the nonrestrictive interpretation, this analysis in principle can apply to all nonrestrictive readings, even those in which there is an entailment relationship between the restrictive and nonrestrictive readings. Thus, I leave open whether *all* nonrestrictive adjectives should be treated specially as such, but there is no harm in supposing they do.

Interpreting the contrastive adjective *larger* out of the scope of the DP simultaneously accounts for i) how the nonrestrictive predication is generated, and ii) why *larger* does not describe the antecedent of *other*. This is illustrated in (28b), which is the intended meaning of (27b), and contrasts with an ordinary restrictive adjective in (28a), which corresponds to (27a).

(27) *(Scenario: There are two books on the table. I point to one of the books.)* Put this^{i} book on the shelf, and take home…

a. the other$_i$ small book. (restrictive)

b. the other$_i$, LARGER book. (nonrestrictive)

(28) a. $[\![$[the [other$_i$ [small book]]]$]\!]^g$ presupposes $\textbf{small}(g_i) \wedge \textbf{book}(g_i)$
foregrounds $\iota x.\textbf{small}(x) \wedge \textbf{book}(x) \wedge g_i \neq x$

b. $[\![$[larger [the [other$_i$ book]]]$]\!]^g$ presupposes $\textbf{book}(g_i)$
foregrounds $\iota x.\textbf{book}(x) \wedge g(i) \neq x$
backgrounds $\textbf{larger}(\iota x.\textbf{book}(x) \wedge g_i \neq x)$

Because contrasting adjectives need to be interpreted outside the scope of the DP, many of the analyses discussed in the previous section, such as Morzycki (2008) or Esipova (2019), are insufficient. This is because they interpret (all) nonrestrictive adjectives within the DP they modify, and thus generate incorrect presuppositions for *other*. That is not to say that their analyses do not capture the data they intended to explain well, but that their analyses cannot be extended to the data I introduce in this paper. In the next two sections, I will develop an analysis based on Potts (2005) to account for additional cases of nonrestrictive adjectives.

3.1 Intonation and focus

The relevant nonrestrictive readings presented above are only available with certain intonational patterns. The most notable differences between a restrictive and nonrestrictive reading are stress on the adjective, and a break before (and possibly after) the adjective. In this section, I will consider to what extent the nonrestrictive readings are the result of intonational cues.

First, I examine the effects of contrastive focus. Contrastive elements are typically emphasized, i.e. marked with contrastive focus intonation, and in many cases, restrictive adjectives are contrastive. That is, the purpose of restrictive adjectives is to contrast the entity or entities the speaker intends to refer to from the rest of the entities which are in the set denoted by the noun.

(29) I read the RED books, but not the BLUE books.

(30) # I loved reading the INTERESTING book. *(out of the blue, with only one salient book)*

This has led some linguists to claim that nonrestrictive adjectives cannot be focused. Umbach (2006) originally made the claim for German, and Leffel (2014) follows Umbach's claim but for English. However, in DPs with *other*, it is nonrestrictive adjectives which are contrastively focused.

(31) I read the red book, but not the OTHER red book.

(32) # I read the red book, but not the OTHER blue book.

(33) I read the red book, but not the other, BLUE book.

These examples are not unexpected, given that the nonrestrictive adjectives contrast directly with the properties of the antecedent (*red* vs. *blue*). Nevertheless, this is a counterexample to the claim that only restrictive adjectives can be contrastively focused. In addition, it is not guaranteed that contrastively focused elements to the right of *other* are nonrestrictive. In (34), B's use of *red* is contrastively focused, but it is not nonrestrictive.

(34) *(Scenario: B is holding a red book and a blue book. There is another red book and another blue book on the table, and the blue book on the table is much heavier than the red one.)*
A: Can you carry the other blue book?
B: No, but I can carry the other RED book.[1]

While contrastive focus often co-occurs with "contrasting adjectives" of *other* (those which do not apply to the antecedent of *other*), contrastive focus is an independent phenomenon from (non)restrictiveness. Contrastive focus on an adjective does not guarantee that it is restrictive or nonrestrictive, and thus, we must be careful to treat these two phenomena independently and in isolation when possible.

The other intonational cue of contrasting adjectives is the prosodic break around the adjective. A similar prosodic break occurs for appositives, which are also claimed to contribute secondary

[1]Thanks to an anonymous reviewer for the example.

meaning (e.g. Potts 2005). It is plausible that nonrestrictiveness and not-at-issueness of the modifier is conventionally marked by the same prosodic break in both cases, but careful intonational studies should be conducted to determine whether the intonational pattern of contrasting adjectives is the same as that of appositives.

3.2 Adjective order

Some have claimed that certain word orders correspond to nonrestrictive and restrictive positions. Cinque (2010) claims that there are specific positions for restrictive and nonrestrictive adjectives; in English, this order is restrictive, nonrestrictive, noun, and then (postnominally) restrictive. He provides this example, where the superlative *most unsuitable* serves as a restrictive adjective, and the other *unsuitable* is nonrestrictive.

(35) Cinque (2010)

a. his most unsuitable unsuitable acts

b. * his unsuitable most unsuitable acts

c. his unsuitable acts most unsuitable

On the other hand, Leffel (2014) predicts that nonrestrictive adjectives must precede restrictive ones. He proposes that the determiner moves but reconstructs in its lower position, so that all of the adjectives higher than the determiner's reconstructed position are treated as nonrestrictive and all lower are treated as restrictive.

I will not discuss postnominal adjectives (see also Larson & Marušič 2004), but I claim that prenominal adjective order is not affected by restrictiveness. In the following examples, the order of adjectives is fixed by independent factors (here by size, then color) and is not affected by restrictiveness. In other words, restrictive and nonrestrictive adjectives do not necessarily appear in a particular order.

(36) a. I read the small red book, but not the other, BIG red book.

b. # I read the small red book, but not the other red, BIG book.

(37) a. I read the small red book, but not the other small, BLUE book.

b. ?/# I read the small red book, but not the other, BLUE small book.

These examples are problematic for any view on which nonrestrictive adjectives always precede or follow restrictive ones, including those where nonrestrictive adjectives need to occupy certain syntactic positions such as Leffel (2014).[2] But under an analysis like Potts (2005), nonrestrictive adjectives can take scope over and modify the DP, regardless of the position it is pronounced in.

3.3 Quantity adjectives

In the examples above, all of the adjectives are lexically ambiguous between nonrestrictive and restrictive readings. That is, given the right intonation and context, each adjective can appear in instances where it is used nonrestrictively and restrictively. It is natural to ask whether there are any adjectives that strongly prefer nonrestrictive readings.

Solt (2009) claims that most uses of quantity adjectives are nonrestrictive for two main reasons: the quantity information in definite descriptions can be new, non-presupposed information, and that quantity adjectives can be paraphrased with nonrestrictive relative clauses or separate sentences, similar to nonrestrictive readings of typical prenominal adjectives. Though none of her reasons are uncontroversial, I present additional evidence to support the idea that quantity adjectives are typically nonrestrictive.

(38) *Context: in a room with six books, I point to some of them.*

a. I finished these two books, and now I want to read the OTHER red books.

b. I finished these two books, and now I want to read the other, RED books.

c. I finished these two books, and now I want to read the OTHER four books.

[2]Leffel's analysis also cannot explain why *other*, a restrictive adjective, precedes nonrestrictive ones.

d. ? I finished these two books, and now I want to read the other, FOUR books.

In (38c), *four* is naturally interpreted nonrestrictively without any special intonation. This contrasts with ordinary quality adjectives like in (38a), in which the two antecedent books are assumed to be red. In fact, the sentence is degraded in (38d), with the parenthetical intonation that we would expect from the examples with quality adjectives seen so far (38b). This is consistent with Solt's claim that numerals are interpreted nonrestrictively by default, since it would explain why unusual intonation is both unnecessary and confusing.

Chapter 4

Modified quantifier phrases

In the previous section, I presented an argument for why nonrestrictive adjectives must be interpreted out of the scope of the DP they modify. It is easy to, following Potts, give a nonrestrictive adjective scope over a definite DP, because the adjective, being type $e \to t$, can be predicated on the referent of the definite DP. However, this analysis will not work for nonrestrictively modified quantifier phrases.

Quantifier phrases have type $(e \to t) \to t$, which is not compatible with the preliminary analysis presented above. Although nonrestrictive adjectives contribute similar backgrounded content as appositive relative clauses, the distribution of nonrestrictive adjectives in quantifier phrases is much less restricted. Nonrestrictive adjectives can modify essentially any kind of quantifier phrase, and they generate different kinds of inferences when compared to appositives. Thus, a Potts-style analysis is insufficient to explain the behavior of nonrestrictive adjectives in quantifier phrases, and it was this insufficiency that led to Morzycki's (2008) analysis, which can also handle modifier quantifier phrases.

One major distinction between nonrestrictive adjectives and appositive relative clauses concerns their attachment properties. Appositives cannot attach to many quantifier phrases, as in (40), while nonrestrictive adjectives can do so freely (39). While there are examples of quantifier phrases with appositives (Arnold 2004, Del Gobbo 2007), there seem to be more restrictions on

their occurrence.

(39) I deleted every embarrassing message.

a. nonrestrictive: I deleted every message. They were embarrassing.

b. restrictive: I deleted every message which is embarrassing (but not necessarily those that are not embarrassing).

(40) appositive relative clause: *I deleted every message, which is/are embarrassing.
intended meaning = (39a)

Not only are nonrestrictive adjectives able to modify a variety of DPs, they generate several kinds of inferences as well, which differ based on what the speaker intends to modify. There are three main kinds of nonrestrictive adjective inferences: individual, kind, and sum (Leffel 2014).

(41) I need to take my sick mother to the hospital.

a. individual-level inference: my mother is sick

(42) Entitled millennials are ruining the economy.

a. kind-level inference: millennials are entitled

(43) I deleted every unsuitable word.

a. sum/subkind-level inference: the words in my paper were unsuitable

Individual-level inferences describe the referent of the DP, when there is one. *Sick* in (41) describes the referent of "my mother". Kind-level inferences describe the entire kind denoted by the noun, such as the kind "millennial" in (42) (Carlson 1977). Finally, sum-level inferences describe a group of entities, within a contextually domain-restricted set. Sum-level inferences describe the maximal set, or "maxset" (Evans 1977), which is the set corresponding to the restrictor of the quantifier. This occurs regardless of whether the quantifier is universal (like *every*) or not; in other words, sum-level inferences ignore the quantificational force.

How do individual-level inferences work in the case of quantifier phrases, where there is no explicit referent? The closest notion of a referent for quantifier phrases would be the witness

set, i.e. the intersection of the restrictor set and the scope set. However, this interpretation is generally not available. For example, (44) cannot be used to convey that the senators who voted for the bill are lazy, which would be the individual-level inference. Typically, (44) means that all of the relevant senators are lazy. Because the maximal set of relevant senators is modified, this is the sum-level inference. A kind-level inference is also available, but not as prevalent as the sum-level, and in practice it can be hard to distinguish between the two.

(44) Few lazy senators voted for the bill.

a. # individual-level inference: the senators who voted for the bill are lazy

b. sum-level inference: the senators (in the US) are lazy

c. kind-level inference: senators in general are lazy

Thus, the form of the DP affects what kind of inferences nonrestrictive adjectives can lead to. Although the focus will be on deriving individual-level inferences from referential DPs and sum-level inferences from quantificational DPs, I will suggest some ways in which kind-level inferences can be derived at the end of this section.

4.1 Informal anaphoric analysis

I suggest that nonrestrictive adjectives mirror patterns seen with nominal appositives.[1] It has long been argued that appositives are linked anaphorically to their anchors (e.g. Sells 1985, Arnold 2004, Nouwen 2007) in that the felicity of an appositive closely corresponds to the felicity of downstream discourse anaphora. For instance, singular appositives cannot modify distributive quantifiers, just as singular pronouns cannot be bound outside of their scope (45). On the other hand, plural appositives can comment on the plurality of elements satisfying the distributive quantifier's restrictor, just as a subsequent plural pronoun can (46).

[1] I chose to draw explicit comparisons between nonrestrictive adjectives and nominal appositives due to the fact that appositive relative clauses are more restricted in their usage, especially in quantifier phrases. However, it turns out that both nominal appositives (Nouwen 2014) and appositive relative clauses (Del Gobbo 2007, Schlenker 2022) are analyzed as anaphoric, and the present anaphoric analysis of nonrestrictive adjectives follows the spirit of both.

(45) a. * Every climber, an experienced adventurer, made it to the summit.

b. * Every climber made it to the summit; he was an experienced adventurer.

(46) a. Every climber, all experienced adventurers, made it to the summit.

b. Every climber made it to the summit; they were all experienced adventurers.

In this section, I informally show how nonrestrictive adjectives can be analyzed as anaphoric to the entity they modify, i.e. to the DP immediately containing them. This allows us to account the properties of contrasting adjectives described in the previous section, while also unifying the definite, indefinite, and quantificational cases. In the next section, I present a formal compositional dynamic fragment that captures the analysis informally described in this section.

I denote adjectives to be interpreted nonrestrictively as labeled with NR. A nonrestrictive adjective is anaphoric to a discourse referent u, written NR_u. NR_u converts adjectives which are restrictive by default into a nonrestrictive adjective which modifies the discourse referent denoted by u. Contrasting adjectives to the right of *other* still need to escape the semantic scope of *other*, so nonrestrictive adjectives are interpreted outside of the DP they modify. This also prevents an adjective anaphoric to u from being evaluated within the DP that introduces that same discourse referent.

In the informal analysis below, I use ιx or $\iota x.\, P\, x$ to pick out the unique x that satisfies P, and similarly Σx or $\Sigma x.\, P\, x$ to pick out the maximal set of x that satisfy P. Operators such as these and existential $\exists$ can introduce discourse referents as superscripts. When subscripted, these discourse referents are evaluated with respect to an assignment function g. Definite and indefinite DP cases are straightforward to account for.

(47) Definite DP: The^u lazy-NR_u student slept.

a. [[lazy-NR_u [the^u student]] slept]

b. asserted: $\textbf{sleep}(\iota^u\, \textbf{student})$

backgrounded: $\textbf{lazy}\, g_u$

(48) Definite DP with *other*: The^u other$_i$, blue-NR$_u$ book is missing.

a. [[blue-NR$_u$ [the^u [other$_i$ book]]] is missing]

b. presupposed: **book** g_i

asserted: **missing**$(\iota^u x.$ **book** $x \wedge x \neq g_i)$

backgrounded: **blue** g_u

(49) Indefinite DP: Some^u annoying-NR$_u$ philosopher attended.

a. [[annoying-NR$_u$ [some^u philosopher]] attended]

b. asserted: $\exists^u x \in$ **philosopher**. **attend** x

backgrounded: **annoying** g_u

In (47), the backgrounded content is **lazy** g_u. The discourse referent u refers to the individual denoted by *the student*, so the backgrounded content says that the student is lazy, as desired. Similarly, in (48), the backgrounded content **blue** g_u evaluates to "the other book is blue". Since *blue* is not evaluated in the scope of *other*, the correct presupposition is predicted as well: the antecedent is a book, not a blue book. Finally, discourse referents introduced by indefinites pose no problem; the backgrounded content in (49) states that the philosopher that the speaker is describing as an attendee is annoying.

Examples like (50) show that non-intersective adjectives like *talented* can be used as a contrasting adjective in the scope of *other*.

(50) A new dancer in class was struggling, so the other, talented dancers came to help him.

Adjectives like *talented (dancer)*, *possible (winner)*, or *recent (retiree)* are analyzed as taking the noun they modify as an argument (Morzycki 2016). That is, they do not combine with the modified noun via set intersection, but via set subsection. An individual can be talented in one domain, but not talented in the other. If *talented* denoted a set of individuals who are talented, then a talented dancer and untalented singer would be predicted to also be a talented singer and untalented dancer. Because this inference should not hold, adjectives like *talented* are subsective adjectives, not intersective, and should take the noun as an argument.

Non-intersective contrasting adjectives can also be handled by this anaphoric analysis. Since the non-intersective adjective *talented* needs to take the noun *dancers* as an argument to determine the kind of talent to attribute to the dancers, I propose that the noun and adjective both scope out of the DP. The noun leaves a trace p, which is abstracted and later filled in by the noun.

(51) Non-intersective contrasting adjective: The^u other, talented-NR$_u$ dancers came.

a. [[[talented-NR$_u$ dancers] [λp [the^u other p]]] came]

b. presupposed: $\textbf{dancers}\, g_i$

asserted: $\textbf{came}(\Sigma^u x.\, \textbf{dancers}\, x \wedge x \neq g_i)$

backgrounded: $\textbf{talented}\, \textbf{dancer}\, g_u$

Finally, I illustrate how the anaphoric analysis derives sum-level inferences from modified quantifier phrases. In (52), *every*^{u} introduces a discourse referent that corresponds to the maximal set of entities which satisfy the restrictor (Evans 1977). Thus, the backgrounded content $\textbf{unsuitable}\, g_u$ evaluates to $\textbf{unsuitable}\, (\Sigma\, \textbf{word})$. Similarly, in (53), g_u evaluates to $\Sigma\, \textbf{senator}$, the maximal set of all relevant senators, and the backgrounded content states that all relevant senators are lazy.

(52) Quantifier DP: Every^u unsuitable-NR$_u$ word was deleted.

a. LF: [unsuitable-NR$_u$ [[every^u word] was deleted]]

b. asserted: $\forall^u x \in \textbf{word}.\, \textbf{deleted}\, x$

backgrounded: $\textbf{unsuitable}\, g_u$

(53) Quantifier DP: Few^u lazy-NR$_u$ senators voted.

a. LF: [lazy-NR$_u$ [[few^u senators] voted]]

b. asserted: $\textsc{few}^u x \in \textbf{senator}.\, \textbf{voted}\, x$

backgrounded: $\textbf{lazy}\, g_u$

As an aside, kind-level inferences can also be derived if we assume that nouns (or at least nouns used as kinds) introduce kind-type discourse referents (Carlson 1977). (54) is an example

of a kind *elephants*. The pronoun *they*$_u$ in the following sentence potentially refers to the kind *elephants*.

(54) Elephants^u are mammals. They$_u$ do not lay eggs.

(55) Kind DP: Entitled-NR$_u$ millennials ruined the economy.

a. LF: [entitled-NR$_u$ [[millennials^u] ruined the economy]]

b. asserted: $\textbf{ruin}(\iota x.\, \textbf{economy}\, x)(\textbf{millennials}^u)$

backgrounded: $\textbf{entitled}\, g_u$

If kind-denoting nouns introduce kind-type discourse referents, it is easy for a nonrestrictive adjective to pick up this discourse referent and modify the kind. Thus, in (55), the backgrounded content is that millennials in general are entitled.

Chapter 5

Formal semantic fragment

In this section, I show how nonrestrictive adjectives can be analyzed as anaphoric update modifiers using post-suppositional techniques that have recently been applied to other scope-taking adjectives like modified numerals (Brasoveanu 2013) and superlatives (Bumford 2017). To analyze anaphora compositionally, I use a compositional dynamic semantics based on Charlow (2014). Additionally, following Charlow (2015), any content that can be made dynamic will be enriched with additional secondary meaning when necessary, allowing for backgrounded or not-at-issue content to be written and passed up the tree without affecting the at-issue composition (Giorgolo & Asudeh 2012).[1]

Like above, DPs introduce discourse referents, as denoted by superscripts, and nonrestrictive adjectives are anaphoric to these discourse referents, as denoted by subscripts. A node with type $\mathtt{M}_\alpha := g \to \{\alpha \times g\}$ denotes a dynamic update; it is a function from (input) assignments to sets of pairs of semantic content with type α and (output) assignments. α itself may be a pair of type $\beta \times t$, where t is a truth value storing not-at-issue/backgrounded content, separated from at-issue content with a bullet $\bullet$. The following two type-shifters will be used as necessary to facilitate composition: $\Uparrow$ to raise an element to an enriched, dynamic type, and $\star$ to combine functions with arguments of an enriched type.

[1] Dynamic composition is facilitated by the StateSet monad, and multidimensionality by the Writer monad.

(56) a. $\Uparrow x := \lambda g.\, \{\langle x \bullet \top, g\rangle\}$ $\qquad \Uparrow :: \alpha \to \mathtt{M}_{\alpha\times t}$

b. $\star\, m := \lambda k.\, \lambda g.\, \{\langle y \bullet s \wedge t, i\rangle \mid \langle x \bullet s, h\rangle \in m\, g, \langle y \bullet t, i\rangle \in k\, x\, h\}$

$\star :: \mathtt{M}_{\alpha\times t} \to (\alpha \to \mathtt{M}_{\beta\times t}) \to \mathtt{M}_{\beta\times t}$

To make denotations more readable, I definite two helper functions. TRUE takes a dynamic truth value (type $\mathtt{M}_t$) and evaluates it at a given context (type g); it returns true if there is any output context such that the dynamic truth value is true, i.e. for any value of an indefinite. TRUE is thus a way to lower dynamic truth values into ordinary ones. MAX takes a function from entities into dynamic truth values, and returns the maximal group of entities such that the entities value the function true at the given input context (for any value of an indefinite). If there is only one such individual, the maximal set is a singleton set and thus returns a unique entity.

(57) $\textsc{true} = \lambda m.\, \lambda g.\, \exists h.\, \langle \top, h\rangle \in m\, g$ $\qquad \textsc{true} :: \mathtt{M}_t \to g \to t$

(58) $\textsc{max} = \lambda P.\, \lambda g.\, \Sigma y.\, \textsc{true}\,(P\, y)\, g$ $\qquad \textsc{max} :: (e \to \mathtt{M}_t) \to g \to e$

Additionally, I define one type shifter which turns ordinary predicates into dynamic restrictors, i.e. functions from ordinary entities to dynamic truth values.

(59) $p^{\blacktriangle} := \lambda x.\, \lambda g.\, \{\langle p\, x, g\rangle\}$ $\qquad {\blacktriangle} :: (e \to t) \to e \to \mathtt{M}_t$

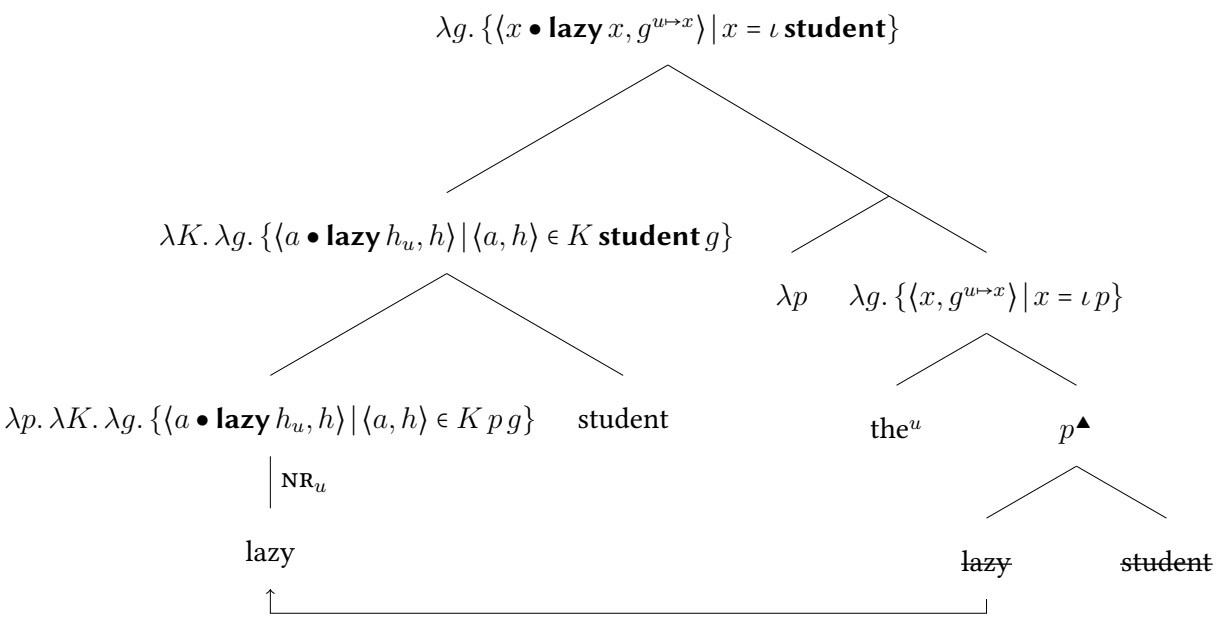
The table below shows all the lexical items needed for the examples in this section.[2] $\textsc{nr}_u$ is the nonrestrictive adjective type shifter for intersective adjectives, and $\textsc{nr-ni}_u$ denotes the nonrestrictiveness type shifter for non-intersective adjectives.

[2] I use et to abbreviate $(e \to t)$.

Item	Type	Denotation
blue	$e \to t$	$\lambda x.\, \textbf{blue}\, x$
book	$e \to t$	$\lambda x.\, \textbf{book}\, x$
talented	$(et) \to et$	$\lambda p.\, \lambda x.\, \textbf{talented}\, p\, x$
other$_i$	$(e \to \mathtt{M}_t) \to e \to \mathtt{M}_t$	$\lambda P.\, \lambda x.\, \lambda g : [\textsc{true}\, (P\, g_i)\, g].\, \{\langle p \wedge x \neq g_i, h\rangle \mid \langle p, h\rangle \in P\, x\, g\}$
some^u	$(e \to \mathtt{M}_t) \to \mathtt{M}_e$	$\lambda P.\, \lambda g.\, \{\langle x, g^{u \mapsto x}\rangle \mid \textsc{true}\, (P\, x)\, g\}$
the$^u_{\text{PL}}$	$(e \to \mathtt{M}_t) \to \mathtt{M}_e$	$\lambda P.\, \lambda g.\, \{\langle x, g^{u \mapsto x}\rangle \mid x = \textsc{max}\, P\, g\}$
every^u	$(e \to \mathtt{M}_t) \to (e \to \mathtt{M}_t) \to \mathtt{M}_t$	$\lambda P.\, \lambda Q.\, \lambda g.\, \{\langle \forall x \forall h.\, \langle \top, h\rangle \in P\, x\, g \Rightarrow \textsc{true}\, (Q\, x)\, h, g^{u \mapsto \textsc{max}\, P\, g}\rangle\}$
$\textsc{nr}_u$	$et \to et \to (et \to \mathtt{M}_\alpha) \to \mathtt{M}_{\alpha \bullet t}$	$\lambda q.\, \lambda p.\, \lambda K.\, \lambda g.\, \{\langle a \bullet q\, h_u, h\rangle \mid \langle a, h\rangle \in K\, p\, g\}$
$\textsc{nr-ni}_u$	$(et \to et) \to et \to (et \to \mathtt{M}_\alpha) \to \mathtt{M}_{\alpha \bullet t}$	$\lambda r.\, \lambda p.\, \lambda K.\, \lambda g.\, \{\langle a \bullet r\, p\, h_u, h\rangle \mid \langle a, h\rangle \in K\, p\, g\}$

First, I present a basic example without *other* or quantifiers, where the adjective *lazy* is interpreted nonrestrictively. While this simple example does not require scoping the adjective or treating it as anaphoric, I show it to demonstrate how it would look under the present analysis.

(60) the lazy$_{\text{NR}}$ student

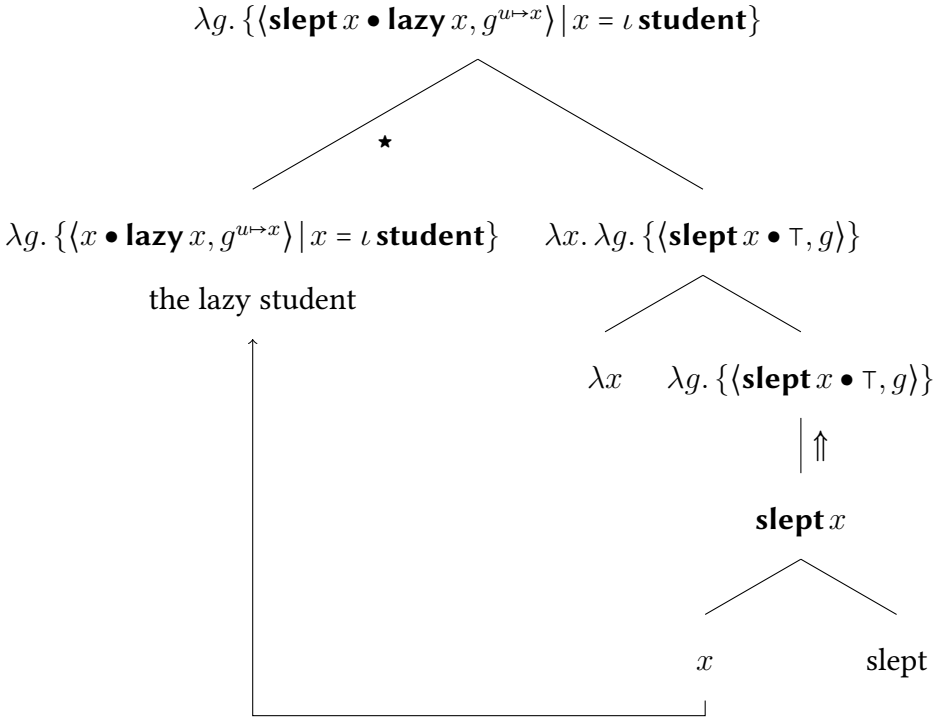


The nonrestrictive adjective *lazy* and the modified noun *student* are evaluated outside of the DP *the lazy student*. The trace left behind is type-shifted with ▲, and combines with the determiner. The trace p is then abstracted, and the denotation of *student* later fills in the abstracted position. Meanwhile, the semantic contribution of *lazy* is forced by $\textsc{nr}_u$ into a secondary dimen-

sion, written to the right of the bullet. The nonrestrictive adjective is anaphoric to the entity it modifies, the student, which has a discourse referent u.

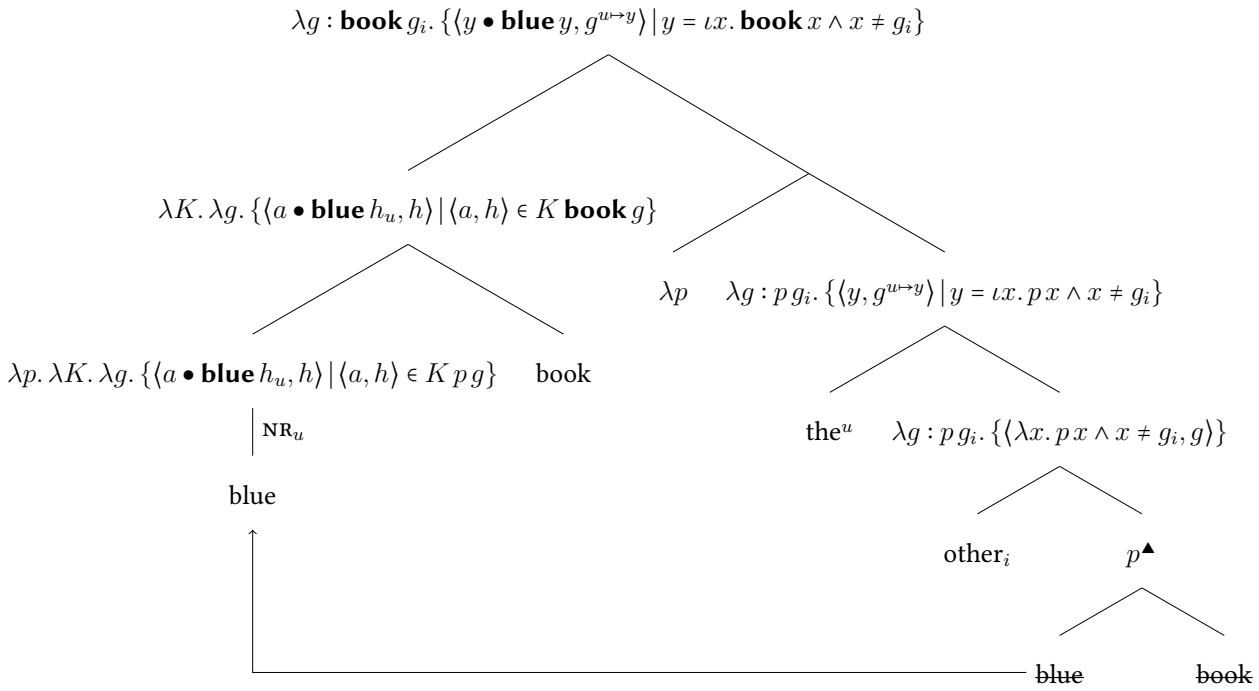
To show how this DP, which contains secondary meaning, can compose with the rest of a sentence, I derive a complete sentence below. The top-most node has primary content which says x slept and secondary content that says x is lazy, where x is the student in both cases.

(61) the lazy$_{\text{NR}}$ student slept



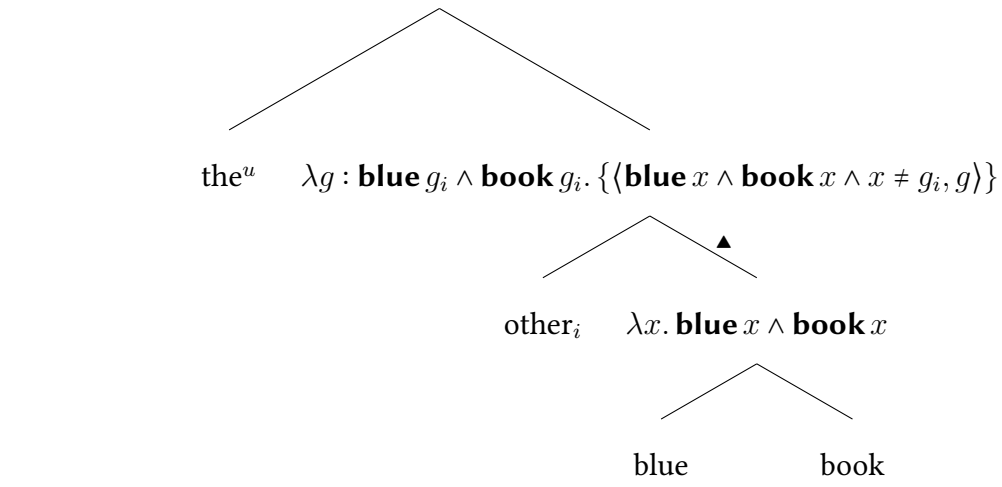
The present anaphoric analysis is able to handle contrasting adjectives in the scope of *other*. Since the adjective is anaphoric to the modified entity, the entity does not need to serve as the argument to the adjective. Thus, it is able to be interpreted outside the scope of *other* while contributing the nonrestrictive inference as desired.

(62) the other, blue$_{\text{NR}}$ book



The top-most node presupposes the existence of an antecedent book, g_i; the primary content is the unique book y which differs from the antecedent; and the secondary content states that y is blue. For comparison, here is *the other blue book*, where *blue* is restrictive.

(63) the other blue$_{\text{R}}$ book

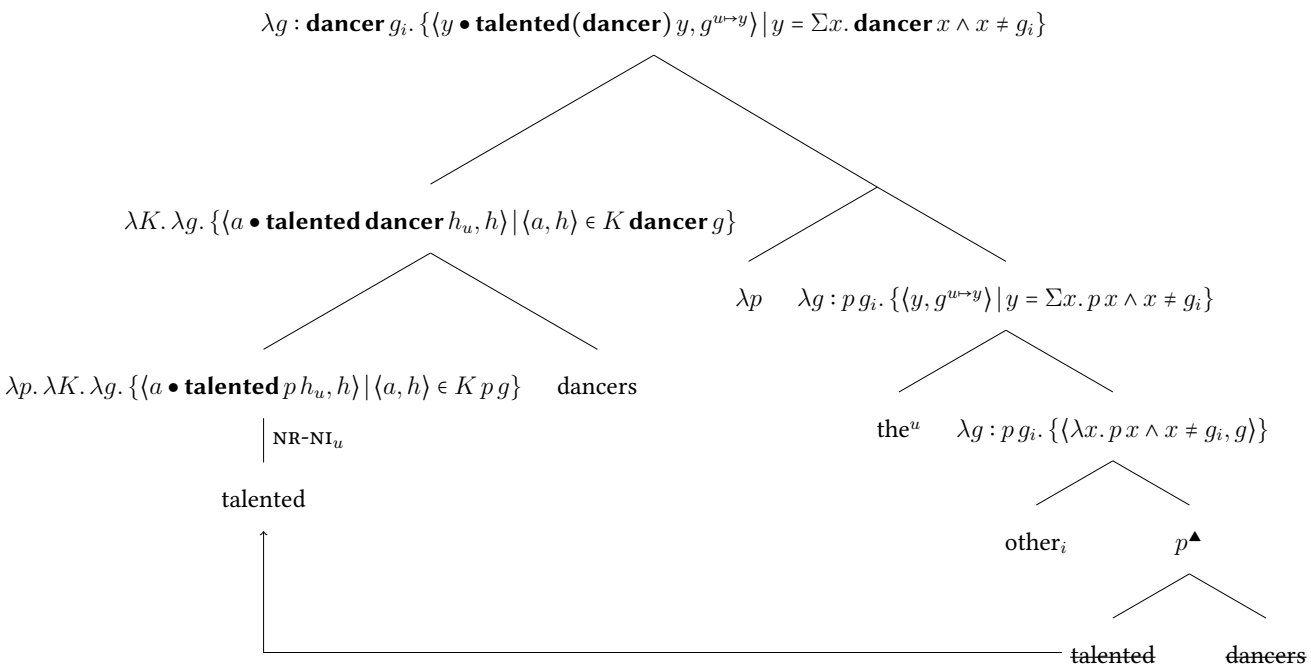


In contrast with the nonrestrictive interpretation in (62), the restrictive *blue* in (63) contributes

to the presupposition of *other*, such that the antecedent book is presupposed to be *blue* as well. Additionally, *blue* is in fact restrictive: it is presupposed (by *the*) that there is only one other blue book besides the antecedent, leaving open the possibility of existence of other books of other colors. There is no secondary or backgrounded content, unlike (62).

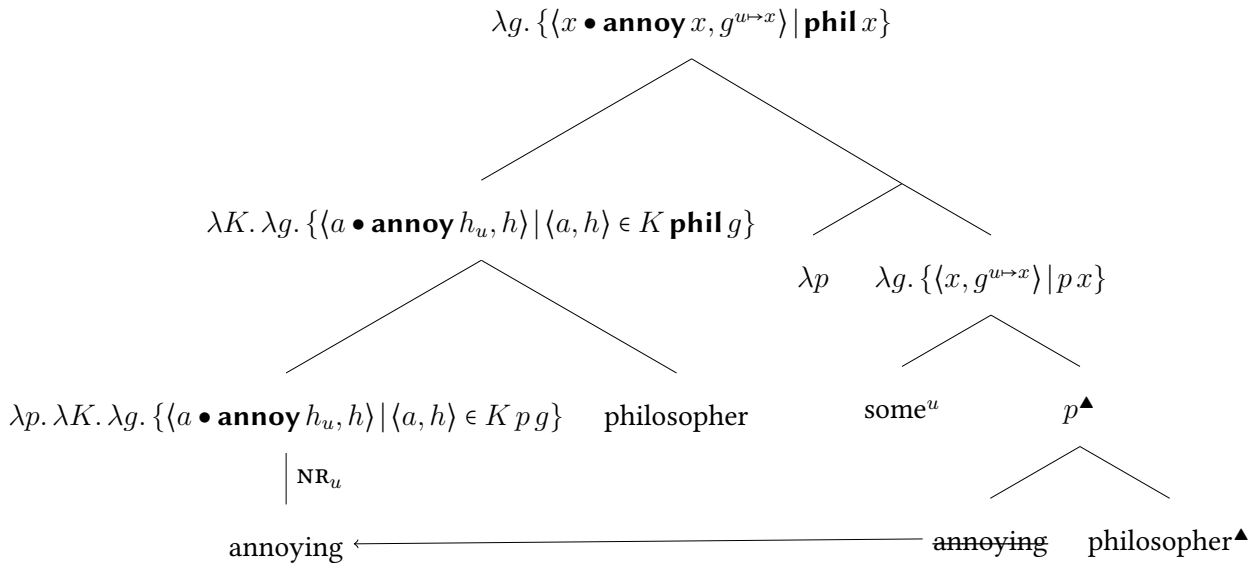
Non-intersective contrasting adjectives like *talented* in *the other, talented dancers* can be analyzed in the same manner. Non-intersective contrasting adjectives require a slightly different type-shifter to deal with the abstracted noun, which I call NR-NI. NR-NI differs from NR only in how the adjective combines with the noun; in this case, modification is set subsection, and thus, the adjective needs to take the noun as an argument. In the top-most node, the secondary content states not that y are talented, but that y are talented dancers.

(64) the other, talented dancers



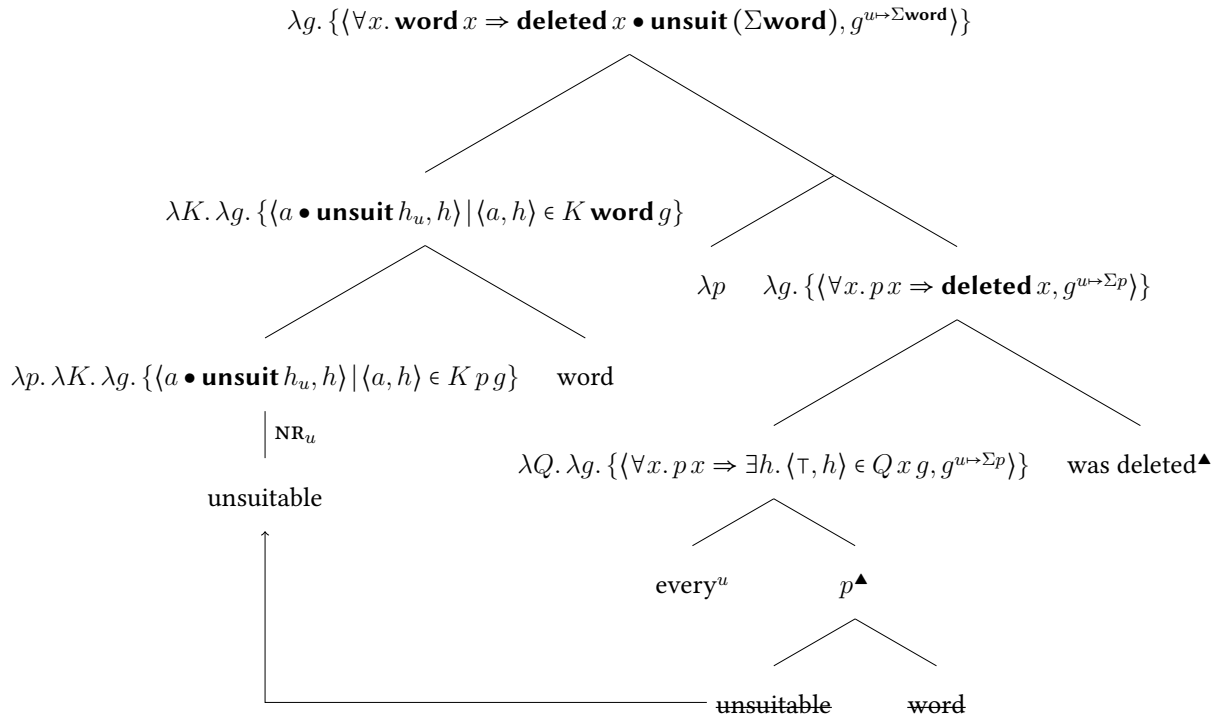
Example (65) contains an indefinite. Following Charlow (2014), indefinites are modeled as nondeterminism via sets of alternatives, so *some philosopher* is a set of tuples whose first component is x, and x ranges over all the possible individuals who satisfy the property of "philosopher". The indefinite *some* also introduces a discourse referent u, so g_u evaluates to whichever philosopher the speaker referred to, and the backgrounded content says that that individual is annoying.

(65) some annoying philosopher



Finally, the example below in (66) demonstrates how nonrestrictive adjectives in quantifiers work under an anaphoric analysis. The inference derived is, as desired, that all the words in the relevant context were unsuitable. Note that the quantificational force does not affect the inference generated by the nonrestrictive *unsuitable*; since all quantifiers make their restrictor set available as a discourse referent, the nonrestrictive adjective will be predicated on the same set regardless of the quantifier. Even with other quantifiers like *most* or *no*, we are still able to derive a nonrestrictive inference, since the entities described by the adjective correspond to the "maxset" discourse referent made available by quantifiers.

(66) every unsuitable word was deleted



A careful reader might notice that the adjective is interpreted after the entire clause *every word was deleted*, as opposed to previous examples, where the adjective is interpreted immediately after the DP. This is possible because the adjective, after being type-shifted with NR and combining with the noun, has type $(et \to \mathtt{M}_\alpha) \to \mathtt{M}_\alpha$. After filling in the $e \to t$ gap in the argument with the noun, the adjective modifies an update (type $\mathtt{M}_\alpha$), in that it adds secondary content to it. NR is defined polymorphically so that the adjective can modify any update – anything with type $\mathtt{M}_\alpha$, such as $\mathtt{M}_e$ (like *the other book*) or $\mathtt{M}_t$ (like *every word was deleted*).

It is necessary for the adjective to be interpreted after the clause in (66) since *every* p does not denote an individual of type $\mathtt{M}_e$, but a function of type $(e \to \mathtt{M}_t) \to \mathtt{M}_t$. Since the nonrestrictive adjective cannot modify this type, it must take propositional-level scope in (66). In fact, a nonrestrictive adjective can always take scope at the propositional level, leading to an analysis reminiscent of Schlenker's (2022) proposal for appositives. It is worth noting that this is made possible by the anaphora-based analysis. Under the current anaphoric analysis, the adjective obtains the individual it modifies via anaphora, and this allows the nonrestrictive adjective can be

interpreted more freely.

In summary, I have shown how basic examples of nonrestrictive adjectives, contrasting adjectives in *other* DPs, and nonrestrictively modified quantifier phrases can all be analyzed under a uniform approach, by treating nonrestrictive adjectives as anaphoric to the entity they modify.

Chapter 6

The contribution of nonrestrictive adjectives

In this section, I discuss what kind of information nonrestrictive adjectives contribute. The information is backgrounded, that is, not at-issue, but not-at-issue content can behave in various ways. Despite their compositional and intuitive similarities to appositive relative clauses, nonrestrictive adjective inferences display different projection behavior and interaction with the common ground. On the other hand, nonrestrictive adjectives do not behave like classical presuppositions on most fronts, but it turns out that they share many of the unique properties of gender presuppositions of pronouns, supporting Esipova's (2019) claims.

Nonrestrictive adjective inferences are claimed to be backgrounded compared to the asserted content of a sentence (e.g. Potts 2005, Esipova 2019), and they are in fact not at-issue. Not-at-issue content (NAI) is peripheral or additional information that is not as prominent as the main content (Simons et al. 2010, among others). This contrasts with at-issue content, which is the main point of an utterance.

One diagnostic is projection from embedding environments. The sentence in (67a) has two entailments: that Andrew used to eat bugs, and that Andrew stopped eating something. However, when the sentence is turned into a question in (67b), only one entailment survives: that Andrew

used to eat bugs. Thus, this is not at-issue, since it projects from embedding environments. On the other hand, that Andrew stopped eating something is an at-issue entailment, which is no longer entailed once the original proposition is not asserted but questioned.

(67) a. Andrew stopped eating bugs.

⇒ Andrew used to eat bugs

⇒ Andrew stopped eating something

b. Did Andrew stop eating bugs?

⇒ Andrew used to eat bugs

⇏ Andrew stopped eating something

As shown in (68), nonrestrictive adjectives contribute not-at-issue meaning. The inference that all other dogs are black projects from – i.e. is not affected by – embedding environments, whether it is negation, modals, or questions.

(68) I pet the white dogs.

a. I didn't pet the other, black dogs.

b. I might pet the other, black dogs.

c. Did you pet the other, black dogs?

⇒ all other dogs are black

Additionally, like other kinds of not-at-issue meaning, nonrestrictive adjectives are not directly deniable. Example (69) contains a presupposition and a nonrestrictive adjective, and saying "No" to deny the statement can only deny the at-issue content, the fact that millennials need to work.

(69) A: Entitled millennials need to work too.

a. B: No, they don't need to work.

b. # B: No, no one else needs to work.

c. # B: No, they're not entitled.

I will compare nonrestrictive adjectives to two major classes of not-at-issue meaning: presupposition and conventional implicature. While they are both not at-issue, they display different properties that have led some linguists to draw a sharp distinction between the two (Potts 2005, 2007, Anderbois et al. 2015). I use the two kinds of meaning as a baseline for comparison, to gain insight into the properties of nonrestrictive adjectives.

6.1 Appositive relative clauses

Nonrestrictive adjectives are intuitively very similar to appositives, which are one of the prototypical examples of a type of meaning called *conventional implicature.* Conventional implicature is additional, backgrounded information contributed by an utterance that is the result of conventional meaning, that is, not calculated from the conversation or context (Grice 1975, Potts 2005, among others).

(70) Arthur, who just got a puppy, has to potty-train it.
appositive: Arthur just got a puppy.

One reason for this intuitive similarity is because nonrestrictive content in general, including adjectives and appositives, is felt to be orthogonal to the asserted content, in contrast to presuppositions (Potts 2005, Abbott 2016). Under Potts' notion of independence, the at-issue content has a truth value whether or not the not-at-issue content is true, and in particular, even when the not-at-issue content is false. Sudo (2012) appeals to a slightly different notion of independence, which is whether one aspect of meaning entails another (such as the asserted meaning entailing the not-at-issue meaning). Examples (71) and (72) shows how both the appositive and nonrestrictive adjective contribute content that is independent from the asserted content by both definitions. That the other competitors are lazy does not logically affect whether the other competitors should quit.

(71) Some competitors are working hard. The other competitors, who are lazy, should quit.

a. asserted: the other competitors should quit

b. appositive: the other competitors are lazy

(72) Some competitors are working hard. The other, lazy competitors should quit.

a. asserted: the other competitors should quit

b. nonrestrictive adjective: the other competitors are lazy

Nonrestrictive adjectives in individual-denoting DPs can generally be paraphrased with appositives, as shown in (71) where the two not-at-issue comments have roughly the same meaning. Additionally, they have been given similar compositional analyses by Potts (2005) as well as in the analyses presented in this paper. Thus, it is a natural guess to treat nonrestrictive adjectives as the same type of meaning as appositives: as conventional implicature.

However, I present two reasons why nonrestrictive adjectives should not be lumped into the same category of meaning as appositives: antibackgrounding effects and projection properties. Appositives are known to display a property called antibackgrounding (Potts 2005), in which the information cannot be entailed by the common ground. That is to say, appositives cannot contain old information without being redundant, and they must introduce only new information. In (73), the appositive *which are both big* is judged as redundant, and therefore infelicitous, if the speaker states the same information – that Marc has two big dogs – beforehand.

(73) (# Marc has two big dogs.) Marc brought his dogs, which are both big, to the park.

However, nonrestrictive adjectives do not exhibit the antibackgrounding requirement of appositive relative clauses, as seen in (74). Nonrestrictive adjectives are able to contribute either old or new information with ease, and repeating information in the common ground does not lead to redundancy.

(74) Marc took his white dogs on a run in the morning. (His remaining dogs are all black.) Because his white dogs were tired, he brought the other, black dogs to the park.

Appositives are said to be *scopeless* (Potts 2005) in that they are never under the scope of em-

bedding operators like conditionals, setting aside a particular *who then (in turn)…* construction discussed by Schlenker (2022). In any case, they have a very strong tendency to project from embedding environments. On the other hand, nonrestrictive adjectives are often sensitive to the entailments of local contexts, such as the antecedent of a conditional (Esipova 2019), in constructions where appositives are not. For example, in (75a), the inference that all non-blue books are red (which would normally be triggered by nonrestrictive *red*) is filtered by the antecedent of the conditional, and thus the overall inference of the sentence is "if all of the books are a primary color, then the non-blue books are red". Using an appositive here (*which are red*), as in (75b), does not lead to the conditionalized inference (barring cases of explicit modal subordination), giving rise to the inference "all of the non-blue books are red".

(75) If all of the books are a primary color, then it'll be easy to separate the blue books from

a. the other, red books.

b. the other books, which are red.

Thus, nonrestrictive adjectives do not behave exactly like appositives, so a natural next step would be to look to see how they behave when compared to presuppositions.

6.2 Presupposition

Presupposition is information taken for granted by the speaker in making an utterance. The example below has at least two presuppositions, the second of which I will call the *gender presupposition* of the pronoun *his*.

(76) Arthur walked his dog in the park.

presupposition 1: Arthur has a dog.

presupposition 2: Arthur is male.

But many canonical presuppositions at least, are not independent from the at-issue content. Usually this is because the at-issue content depends on the presupposition in some way, e.g. it

would not make sense if the presupposition is not satisfied. Example (77) has many presuppositions; two of them are listed below. For comparison, the example from before showing the independence of nonrestrictive adjective is repeated below in (78).

(77) The first-place winner is proud of herself.

a. asserted: the first-place winner is proud of the first-place winner

b. presupposition 1: there is a person who won first place (prerequisite)

c. presupposition 2: the first-place winner is female (independent)

(78) Some competitors are working very hard. The other, lazy competitors should quit.

a. asserted: the other competitors should quit

b. nonrestrictive adjective: the other competitors are lazy

The first presupposition, (77a), is not independent because it is a prerequisite for the asserted content; if there is not a person who won first place, then *the first-place winner is proud…* cannot be evaluated. On the other hand, if the presupposition in (77b) is false, i.e. if the first-place winner is not female, it has no bearing on whether the first-place winner is or can be proud or not. So we can say presupposition 1 is not independent, while presupposition 2 is. Gender presuppositions in general are independent, and in this way are like nonrestrictive adjectives.

Next, let us consider how presuppositions interact with the common ground. Strong presuppositions are defined by a property called Strong Contextual Felicity (Tonhauser et al. 2013): the information they contribute must be entailed by the common ground. In other words, if a strong presupposition is not already in the common ground, a listener will find the utterance strange and is unlikely to accommodate the presupposition. (79) is strange to utter unless it is already known or said that someone besides Ryan, such as Marc, has two dogs. On the other hand, the sentence in (80) has at least three presuppositions, which are listed below. None of these need to be said by the speaker or known by the listener for the utterance to be felicitous. In particular, the gender presupposition (80c) does not exhibit Strong Contextual Felicity.

(79) # (Marc has two dogs.) Ryan has two dogs too.

(80) My neighbor sold her house.

a. presupposition 1: I have a neighbor.

b. presupposition 2: My neighbor has a house.

c. presupposition 3: My neighbor is female.

Like all of the presuppositions of (80), and unlike (79), nonrestrictive adjectives do not exhibit the Strong Contextual Felicity property of strong presuppositions as seen in (81). It does not need to be established that Marc's all of other (non-dog) pets are slimy, and the listener can learn this new information from the use of the nonrestrictive adjective. As established in the previous subsection, nonrestrictive adjectives do not exhibit antibackgrounding either; in other words, they are able to contribute either old or new information.

(81) Marc has many pets. He loves walking his dogs, but he doesn't walk his other, slimy pets.

Finally, I compare the projection properties of presuppositions and nonrestrictive adjectives. Nonrestrictive adjectives are more resistant to local accommodation under logical operators than standard (weak) presuppositions. While the continuation in (82a) indicates that the speaker is negating the presupposition triggered by *finished* in (82), the continuation in (82b) is infelicitous, showing that it is impossible for the speaker to negate the inference triggered by the nonrestrictive adjective – that all of the other books are red. Similarly, the continuation in (82c) is also infelicitous because the speaker cannot negate the presupposition of *his* even though it is in the scope of negation.

(82) Sam couldn't possibly have *finished* reading *his* other, *red* books this morning…

a. He hasn't even started reading them!

b. # His other books are yellow!

c. # Sam is a girl, so she would be reading *her* books!

Additionally, presuppositions in general, like nonrestrictive adjectives, can be filtered by the antecedent of conditionals. (83) does not presuppose that Robin is male or that Robin is female. Because the presupposition is filtered by the antecedent of the conditional, the true presupposition of (83) is something along the lines of "if Robin is a boy, then Robin is male, and if Robin is a girl, then Robin is female", which is trivially true. Likewise, in (84), *other, white dogs* does not state that all non-black dogs are white, because it is felicitous to follow the sentence with *But if there are only black or brown dogs…*. The nonrestrictive adjective inference merely says that if dogs are either black or white, then all non-black dogs would be white, which again, is trivially true.

(83) A new student Robin has shown up, and I need to assign a dorm room to the new student. If Robin is a boy, I'll put him in building A, but if Robin is a girl, I'll put her in building B.

(84) If dogs are either black or white, then it'll be easy to separate the black dogs from the other, white dogs. But if they are only black or brown, then it'll be harder to separate them.

For more details on comparing various properties of nonrestrictive adjectives, appositives, and presuppositions, see Appendix A. There, one can find a table summarizing these various properties, as well as example sentences for each.

I conclude by discussing the choice of data in this section. Some researchers have treated all adjectives as compositionally restrictive, and claimed that the nonrestrictive inference is a pragmatic phenomenon, the result of trivial restriction (e.g. Esipova 2019). However, most of the examples of nonrestrictive adjectives I present in this section are contrasting adjectives after *other*. This helps us control for the possibility that the results may be confounded by the fact that many adjectives appear within a definite DP, which has a presupposition of its own. In fact, as shown in Section 3, contrasting adjectives in the scope of *other* cannot be interpreted within the DP, and thus, they do not contribute to the presupposition of the definite determiner. The fact that my findings with *other*-contrasting adjectives, which must be interpreted nonrestrictively,

replicate Esipova's (on the diagnostics she tests), who only uses adjectives ambiguous between restrictive and nonrestrictive readings, demonstrates how nonrestrictive adjectives behave similarly, regardless of the kind.

Chapter 7

Conclusion

In this paper, I have presented a case for nonrestrictiveness as a semantic phenomenon. Interpretation of contrasting adjectives within the syntactic scope of a non-intersective adjective like *other* often requires for the contrasting adjective to be interpreted in a nonrestrictive way: it is evaluated outside of the scope of *other*, and it is predicated on the entire class of objects it modifies, not just a subset. Additional data from modified quantifier DPs motivate an anaphoric analysis, since nonrestrictive adjectives are able to modify quantifier phrases and derive inferences on the entire restrictor set, which we know is made available for anaphora with any quantifier. Then, I presented a formal semantic fragment which is compositional and dynamic. The fragment is able to handle contrasting adjectives in *other* as well as modified quantifier phrases.

After presenting an analysis of the composition of nonrestrictive adjectives, I discussed what kind of meaning nonrestrictive adjectives contribute and how they update the common ground. Though they are compositionally and intuitively similar to appositives, their meaning projects less strongly, and the contribution of nonrestrictive adjectives need not be new information. On the other hand, nonrestrictive adjective inferences project like presuppositions, and display many similarities to the gender presuppositions of pronouns.

While I did not provide a formal update semantics for nonrestrictive adjectives that would capture these informational-structural patterns, this is a natural next step. It would also be worth-

while to examine the connection between nonrestrictive adjectives and gender presupposition, to see if there is an explanation for why they behave so similarly. In a way, gender presuppositions can be viewed as a nonrestrictive modifier as well, as comments about one property (the gender) of a DP. But it is not yet clear why appositives display divergent projection behaviors. Ideally, future research will lead to a theory of nonrestrictiveness that is compositionally united, but allows for nonrestrictive adjectives to update the common ground like gender presuppositions, and unlike appositives.

One open question involves the intonation of nonrestrictive adjectives. Given that appositives require a special intonation, why don't nonrestrictive adjectives also require a special intonation in all cases? One might say that between *other* and a contrasting adjective is an intonational break, which is true. But this break does not appear when there is only one adjective, for example in (85). A rigorous study into the intonational patterns of nonrestrictive adjectives – both with other (non-intersective) adjectives and alone – should be conducted to gain additional insights on the intonational cues of nonrestrictive adjectives, which are subtle, if any do exist at all.

(85) The lazy senators skipped the meeting.

The issue of intonation has larger implications for nonrestrictiveness in general. If there are no special intonational cues, then perhaps there is no way to distinguish between a nonrestrictive interpretation of (85), and a special case of a restrictive interpretation whereby the modifier does not do any restricting work. That is to say, while I have presented clear cases of nonrestrictive adjectives in the form of contrasting adjectives in the scope of *other* (or similar non-intersective adjectives), these data have no definitive bearing on adjectives which may seem nonrestrictive, but which are compatible with restrictive interpretations. Or perhaps the most basic cases like (85) involve yet another different mode of combination, separate from my proposed analysis or the default restrictive mode. But under the anaphoric analysis detailed in Section 4, all nonrestrictive adjectives receive a uniform analysis, even if not all of the examples of nonrestrictive adjectives require such a mechanism.

Appendix A

Properties of not-at-issue content

This table summarizes various properties of not-at-issue meaning and where different kinds of not-at-issue meaning stand with respect to these properties. Much of the data and the projection patterns for appositives and presuppositions are based on Potts (2005) and Esipova (2019), respectively. In each example below, (a) tests properties of presuppositions, (b) of appositives, and (c) of nonrestrictive adjectives.

property	PS	ARC	NRA
deniability/at-issueness	x	x	x
must it contribute old information?	o/x	x	x
must it contribute new information?	x	o	x
is its truth value independent from assertion?	o/x	o	o
does it project from negation?	o/x	o	o
can it be filtered in conditional consequents?	o	x	o
does it project from right disjuncts?	x	o	x
are inferences acceptable despite explicit ignorance?	o	x	x

Presuppositions can be the target of denial/negation, appositives cannot; neither can nonrestrictive adjectives.

(86) a. The idea that Jonah finished reading the other, easier books this morning is inconceiv-

able… He hasn't even started reading them!

b. The idea that Jonah finished reading the other books, which are easier, this morning is inconceivable… # The other books are harder!

c. The idea that Jonah finished reading the other, easier books this morning is inconceivable… # The other books are harder!

Nonrestrictive adjectives, like presuppositions, can be sensitive to embedding contexts (though sometimes they are not); appositives can not. For presuppositions, this is known as the Proviso Problem (Geurts 1996).

(87) a. If Wendy buys another statue, she'll show off both her statues when you visit.
⇒ If Wendy buys another statue, she'll have two statues.

b. If Wendy buys another statue, she'll show off her statues, which she has two of, when you visit.
⇒ Wendy has two statues.

c. If Wendy buys another statue, she'll show off her two statues when you visit.
⇒ If Wendy buys another statue, she'll have two statues.

Similarly, presuppositions and nonrestrictive adjectives are sensitive to the embedding context in disjunctions, while appositives project universally. The negation of the left disjunct serves as the local context in which the right disjunct can be evaluated.

(88) I washed all the white socks I saw.

a. Either there are no more socks, or I didn't see the other socks.

b. # Either there are no black socks, or I didn't see the other socks, which are black.

c. Either there are no black socks, or I didn't see the other, black socks.

It is possible to use (i.e. locally accommodate) a presupposition trigger after denying that you know whether it is true, but this is not possible for nonrestrictive adjectives (Esipova 2019) or appositives.

(89) a. I don't know if Pam has a camera, but she might bring her camera.

b. # I don't know what kind of cameras Pam has, but she might bring her other, small cameras.

c. # I don't know what kind of cameras Pam has, but she might bring her cameras, which are small.

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