Syntax and Prosody of Coordination

by

Danfeng Wu

B.A., Mathematics and Economics
Columbia University, 2012

Submitted to the Department of Linguistics and Philosophy
in partial fulfillment of the requirements for the degree of
Doctor of Philosophy

at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

September 2022

Signature of author: _____
Danfeng Wu
September 8, 2022

Certified by: _____
Edward Flemming
Associate Professor of Linguistics
Thesis supervisor

Certified by: _____
Danny Fox
Anshen-Chomsky Professor of Language and Thought
Thesis supervisor

Certified by: _____
David Pesetsky
Ferrari P. Ward Professor of Modern Languages and Linguistics
Thesis supervisor

Accepted by: _____
Danny Fox
Anshen-Chomsky Professor of Language and Thought
Department Head

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Abstract

This thesis investigates the syntactic and prosodic properties of what I call *correlative coordination*; coordination where each *junct* (i.e., conjunct or disjunct) has an overt coordinator (e.g., *either…or…*). I argue that the coordinators are focus-sensitive operators, and each coordinator has two positions. Only the higher position is semantically interpreted, and the lower position is semantically vacuous. These findings dovetail with previous proposals in other empirical domains, suggesting that perhaps all focus-sensitive operators have two positions in a sentence, and are interpreted in the higher position (e.g., Lee 2004, Cable 2007, Hole 2015, 2017, Hirsch 2017, Quek & Hirsch 2017, and Bayer 2018). The results reported here also suggest that the coordinator, traditionally considered to be the head of coordination (e.g., *or* and *but*), may not be the actual head, but just the daughter of a junct. A covert abstract Junction head takes all the juncts as its sister, and projects to the coordinated phrase. This is identical to Al Khalaf's (2005) analysis of coordination, but supported here by different types of evidence.

At the same time, correlative coordination does not always *look like* it has the syntax that I argue for. When the coordinators seem to be higher than where I claim, I argue that ellipsis has occurred to obscure the actual size of coordination and the position of the coordinators.

In my syntactic theory of coordination, ellipsis is a veil that obscures the underlying syntax of coordination. In the second part of this thesis, which studies the mapping from syntax and prosody, I put ellipsis in the spotlight, and ask if elided material is truly silent. In a prosodic experiment that studies ellipsis in coordination, I argue that elided material has prosodic representation, despite being silent. I confirm previous experimental results that there is a close correspondence between syntax and prosody in coordination. Because the syntactic structure of coordination is recursive, this means that the prosodic structure may also be recursive, and replicate the dominance relations in syntax.

I further argue that there is a close syntax-prosody correspondence, even when the coordinated phrases contain elided material. This has implications for the prosodic representation of silent material. An important assumption in the literature on syntax-prosody mapping is that silent material (e.g., null heads and their projections, and perhaps traces, etc.) does not have prosodic representation (Nespor & Vogel 1986; Chen 1987; Truckenbrodt 1999; Elfner 2015). Viewing this assumption in light of my experimental results, it appears that there may be a dichotomy of silent material: while null heads and their projections do not have prosodic representation, elided material does. Assuming a derivational account of the syntax-prosody mapping, a possible interpretation of these results is that prosodic structure is created at a point when material to be elided is not yet deleted, leaving effects of deleted material in prosody. But at this same moment

of creation of prosodic structure, vocabulary insertion has already occurred, so that the syntax-prosody mapping can ignore phonologically null elements.

Because ellipsis has prosodic effects, we may be able to detect elided structure not just based on syntactic-semantic evidence, but also based on prosodic evidence. I demonstrate this with another prosodic experiment that argues for the presence of ellipsis in correlative coordination based on subtle phonetic effects in prosodic boundaries. In doing so, I follow the tradition of drawing evidence for syntactic claims from prosody (e.g., Bresnan 1971 and Clemens & Coon 2018).

Thesis Supervisor: Edward Flemming
Title: Associate Professor of Linguistics

Thesis Supervisor: Danny Fox
Title: Anshen-Chomsky Professor of Language and Thought

Thesis Supervisor: David Pesetsky
Title: Ferrari P. Ward Professor of Linguistics

Acknowledgements

My committee:
The co-chairs of my committee, Edward Flemming, Danny Fox, David Pesetsky and Maziar Toosarvandani, have helped me tremendously with their advising and mentorship.

Yadav Gowda and I had budding interest in prosody in our third year, and Edward generously agreed to teach us private lessons (as "independent study"), which inspired so many thoughts and questions in me that eventually developed into an important part of my research program. I am also grateful for Edward's generosity: he always makes sure that all my questions get answered, which sometimes means meeting for 2-3 hours and additional meetings at short notice.

Danny has not only taught me how to do research, but also how to present it. One of many important lessons that Danny has taught me is to try to model the mind of an intelligent but ignorant reader when I write, in which case knowledge of pragmatics could help. With his intellectual creativity, genuine curiosity and drive to solve linguistic puzzles, Danny has inspired an interest in semantics and pragmatics in me, something I hadn't expected to develop.

David is the reason why I am here. In 2015 I was at the crossroads of life: having just quit my job in the automobile industry, I wanted to pursue my longtime interest in syntax, but didn't know how. I met David at the LSA Summer School at UChicago, which changed my life. On the last day of summer school, David, somehow having spotted something in me, approached me and invited me to audit at MIT, which started my linguistic journey. He has continued to be an inspiring teacher, a caring mentor, an idea spotter and a firm believer in me, even when I am in doubt of myself.

I am grateful to Maziar for sharing his linguistic ideas and life wisdom. Several chapters of this dissertation are built important ideas of his. We had many stimulating discussions, albeit over Zoom, but I look forward to finally meeting him in person.

My mentors beyond the committee:
Athulya Aravind and Shigeru Miyagawa are my mentors in academic life and beyond. Athulya has been a dedicated and unwavering supporter and a generous and caring guide through every aspect of academic life. Shigeru has set an example to me not only in research, but also in how to connect with others with respect and care. I will cherish memories of sushi meals in Ginza and Fuji, thoughtful and surprising Japanese presents and CreteLing memorabilia. I look up to Athulya and Shigeru as role models: they have navigated the professional world skillfully, continued to care about students and young researchers deeply and speak up for them, and demonstrated that scholars from minority backgrounds can succeed.

My collaborators, discussants and data providers:
This work has benefited from discussions with Adam Albright, Athulya Aravind, Neil Banerjee, Itai Bassi, Keny Chatain, Fulang (Cater) Chen, Marcel den Dikken, Patrick Elliott, Kai von Fintel, Naomi Francis, Yadav Gowda, Aron Hirsch, Sabine Iatridou, Michael Kenstowicz, Filipe Kobayashi, Anton Kukhto, Richard Larson, Shigeru Miyagawa, Mitya Privoznov, Norvin Richards, Bernhard Schwarz, Roger Schwarzschild, Frank Staniszewski, Donca Steriade, Michael Wagner and Stanislao Zompì. I also want to acknowledge my collaborators for work that was not included in this dissertation: Boer Fu, Yadav Gowda, Masatoshi Koizumi, Shigeru Miyagawa and Elise Newman.

For linguistic judgments included in this work, thank you to Neil Banerjee (Bengali), Rafael Abramovitz, Neil Banerjee, Christopher Baron, David Pesetsky, Cora Lesure, Elise Newman, Frank Staniszewski (English), Sabine Iatridou (Greek), Itai Bassi (Hebrew), Barbara Citko, Barbara Tomaszewicz Bartosz Wiland (Polish), Tanya Bondarenko, Anton Kukhto and Mitya Privoznov (Russian).

The linguistics department at MIT:
I have learned tremendously from the linguistics faculty at MIT, first as an informal visitor and later as a formal student. I am especially grateful to those who did not mind my informal visitor status in Fall 2015, and taught me and welcomed me with open arms: Sabine Iatridou, Roger Schwarzschild, Donca Steriade (who kindly invited me to Thanksgiving dinner at her apartment). I am also grateful to ling-15 for inviting Keny Chatain and me to use their first-year office and including us in their cohort, even though we were technically visitors.

In 2019 I had the crazy idea of creating a linguistics course for researchers in cognitive science and computer science to bridge linguistics and those departments. I am grateful to the linguistics faculty for taking it seriously and actually making it happen in Fall 2019. I thank the instructors of this course, Adam Albright, Athulya Aravind, Martin Hackl and David Pesetsky, for volunteering to teach. I also thank the section head at the time, Kai von Fintel, and the other faculty members for making sacrifices and taking on more teaching load than usual, to make this course happen.

I express gratitude to Val Gaviria, Chrissy Graham, Mary Grenham, Chris Naylor, Jen Purdy and Matt Sikorski for all their work in running the department, and especially for the loving food package at the beginning of the pandemic, when I was in isolation. I thank Leo Rosenstein, Rachel Stacey and Cindy Torma for helping me run my experiments smoothly.

My research assistants:
I want to thank the UROPs who helped me with various projects along the way: Allie Amerman, Aquila Simmons, Alyssa Solomon, Kitty Zeng, Xiaomeng Zhu. I am also grateful that what began as work relationship evolved into mentorship and friendship with many of them.

Friends at MIT:
I had six wonderful years at MIT, thanks to the company of friends. I am so fortunate to feel like I belong to two cohorts–ling-15 (Rafael Abramovitz, Itai Bassi, Justin Colley, Colin Davis, Suzana Fong, Verena Hehl, Maša Močnik, Mitya Privoznov) and ling-16 (Neil Banerjee, Christopher Baron, Keny Chatain, Yadav Gowda, Cora Lesure, Elise Newman, Frank Staniszewski).

I am grateful for the beautiful view from my office and the amazing officemates to share it with, Ruyue (Agnes) Bi, Kenyon Branan, Keny Chatain, Sherry Yong Chen, Yadav Gowda, Peter Grishin, Cora Lesure, Elise Newman.

I could not have finished this dissertation without the company and discipline of my library study buddies, Fulang (Cater) Chen and Jingyi Guo. I will cherish memories of gym sessions, neighborhood tours, restaurant sampling, many conversations over snail soup and movie screenings with Cater. We carried each other through a difficult period for both of us.

24.888 is probably my favorite seminar at MIT. It brought me to restaurants I would have never gone to by myself and great friendship with Ruyue (Agnes) Bi, Sherry Yong Chen, Peter Grishin, Filipe Kobayashi, Keely New, Tamisha L. Tan and Yi-Chi (Yvette) Wu.

I miss hiking and board games before the pandemic with the "Saturday strollers", Neil Banerjee, Ruyue (Agnes) Bi, Keny Chatain, Peter Grishin, Anton Kukhto, Mitya Privoznov and Hyun Ji

Yoo. It was so rewarding to solve puzzles at Puzzled Pint with great friends, Neil Banerjee, Christopher Baron, Ruyue (Agnes) Bi, Keny Chatain, Sherry Yong Chen, Yadav Gowda, Elise Newman and Frank Staniszewski. Puzzled Pint happens every month, and gives a sticker to those who have solved all the puzzles. There is a reward for collecting 12 stickers. I had finally collected 12 stickers, but just when I was about to collect my reward, the pandemic happened. Two and a half years later, I went to Puzzled Pint in celebration of Elise's graduation, and was surprised to get my rewards there, even with my name printed on them. I also enjoyed all the fun events and friendship of neighbors at Sidney Pacific.

Family and old friends:

I am grateful to have my parents as parents: they have resolute confidence in me, make me feel really special, and gave me unconditional support, warm acceptance and total freedom to do whatever I want. A lot of this warmth, ease and love are inherited from their parents, who look at me like I am the best thing that ever happened to them. I also get that from my cousin, Xiaoyu (Jojo) Dong, who has looked up to me, both literally and figuratively, since she was an infant. Respect and affection from her and the rest of my family have grounded me, empowered me and reminded me of who I really am in difficult times.

Friends from college and high school have supported me through ups and downs in graduate school. I know I can call Karen Shuting Cai, Fei Gao, Jennifer Lee, Eileen Li, Scott Liu, Junwei Lu, Yi Louis Lu and Yijia Zhang any time, and they would listen and help. Anya and Joe Stiglitz have become my family in the US, welcomed me every Christmas, and made me feel like I truly belong.

For my parents.

Contents

Chapter 1
Introduction

1. Introduction

This dissertation has two main themes that reinforce each other: syntax-semantics and syntax-prosody mapping. This dissertation investigates these two topics through the empirical phenomena of focus and ellipsis in coordination.

I focus on a type of coordination specifically–what I call *correlative coordination*, where each conjunct / disjunct (which I refer to with the general term *junct*) has an overt coordinator. For example, *either A or B* is correlative coordination because the disjuncts A and B follow *either* and *or* respectively, which I call the *coordinators*. In correlative coordination, the position of the first coordinator is usually quite free. Consider the following *either…or…* sentences as an example:

(1) a. Max will eat **either** spinach or chard.
b. Max will **either** eat spinach or chard.
c. Max **either** will eat spinach or chard.
d. **Either** Max will eat spinach or chard.

In this dissertation, I argue that part of the reason for the free distribution of the first coordinator (e.g., *either* in *either…or…*) is that the first coordinator is a focus-sensitive operator, and like other focus-sensitive operators, it has two different positions in a sentence. Only the higher position is semantically interpreted, and the lower position is semantically vacuous.

This analysis supports a cross-linguistic generalization that perhaps all focus-sensitive operators have two positions in a sentence (e.g., Lee (2004), Cable (2007), Hole (2015), (2017), Hirsch (2017), Quek & Hirsch (2017), and Bayer (2018)), and offers a possible explanation: each position of the focus particle satisfies a grammatical role. In the case of *either*, the lower position marks the position of focus, while the higher position is the daughter of the first disjunct, and tells us the semantic scope of disjunction. For example, Cable argued based on languages such as Tlingit, Sinhala and Japanese that in a *wh*-question like in (2a), there is actually a covert Question-particle that moves ((2b); the base position of the operator and the *wh*-phrase is struckthrough). This Question-particle is a focus-sensitive operator, and when it moves, it pied-pipes the focused *wh*-phrase.

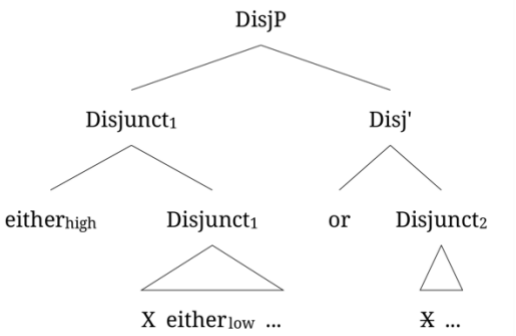
(2) a. What did Kim eat?
b. [Q what]$_i$ did Kim eat ~~[Q what]$_i$~~?

Another example of a focus-sensitive operator that has two positions is *only*. Hirsch (2017) has argued that in an *only*-sentence like (3a), though we only hear one instance of *only*, there is actually another instance of *only* that we don't hear ((3b) illustrates one possible location of this unpronounced *only*).

(3) a. Kim only ate only the spinach.
b. Kim ~~only~~ ate only the spinach.

In chapter 2, I focus on *either…or…* sentences, and argue that *either*, like the Question-particle and *only*, has two positions. Evidence involving phenomena such as constituency and scope suggests that *either*'s higher position (i.e., $either_{high}$ in (4)) is the daughter of the first disjunct. But *either* sometimes appears higher than this position, which I argue is an illusion due to ellipsis. Ellipsis, specifically stripping (e.g., struckthrough X in (4)) can occur in the second disjunct and obscure the actual size of disjunction and *either*'s actual position.

(4) *My analysis of either…or… sentences*

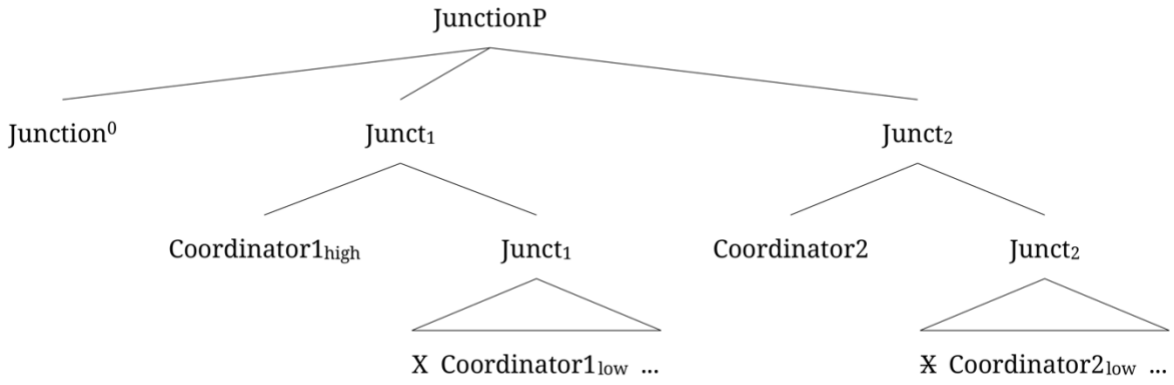


Following this analysis that the higher position of *either* is adjacent to the disjunction, if there is a variant of *either* that moves further up from its high position, and can in addition bring along other material as it moves (i.e., *pied-pipe*), then we should be able to see this variant of *either* pied-pipe the disjunction phrase. In chapter 3, I argue that 'whether' and 'neither' in English and Polish are precisely such variants of 'either', in contrast to 'if' in English and Bengali, which does not move and therefore does not display the behavior of pied-piping the disjunction.

In chapter 4, I argue that corrective *but* sentences (which I also call *negation…but…* sentences), a construction apparently unrelated to *either…or…*, nevertheless have the same analysis as *either…or…*, with two positions for negation. I then extend my analysis of the first coordinator (e.g., *either* and negation) to the second coordinator (e.g., *or* and *but*), and extend the analysis to coordination of more than two conjuncts.

This leads to a generalized analysis of all correlative coordination (5): in all types of correlative coordination, each coordinator (i.e., Coordinator1 and Coordinator2 in (5)) has two positions, with the higher position being the daughter of a junct and the lower position being deeply embedded in the junct. The positions of the coordinator can be obscured by ellipsis. These juncts then merge with a covert abstract $Junction^0$, which projects to JunctionP. One possible way to implement this is an n-ary branching JunctionP, though this analysis is compatible with strictly binary branching as well.

(5) *My generalized analysis of correlative coordination*



My analysis departs from the common view that the second coordinator (e.g., *or* and *but*) is the head of JunctionP (e.g., Collins (1988); Johannssen (1998)). I argue that the second coordinator is just like the first in being the daughter of a junct. This structure is similar to Al Khalaf's (2005) analysis of coordination in that the coordinators are the daughters of the respective juncts, but she got to the analysis from evidence based on facts such as binding and selection. The fact that independent evidence converges on the same analysis further supports the structure proposed here.

Not only does coordination have interesting syntactic-semantic properties, but it also has unique prosodic properties that make it a great place to study the mapping between syntax and prosody–the second theme of my dissertation.

This dissertation studies the syntax-prosody mapping with the following two goals in mind. First, it studies what sort of syntactic information is mapped onto prosody, and how prosodic structure reflects that syntactic information using a modality totally different from syntax. Second, it follows the tradition of drawing evidence for syntactic claims from prosody (e.g., Bresnan (1971) and Clemens & Coon (2018)).

I study the syntax-prosody mapping in a somewhat surprising domain: ellipsis. Because elided material has no phonological content, we might expect it to have no prosodic effects, either. In chapter 5, I present a prosodic experiment that suggests that elided material actually has prosodic representation.

If elided material has prosodic representation, can we in turn use prosodic evidence to argue for ellipsis? In chapter 6, I present another prosodic experiment that suggests the presence of ellipsis in corrective *but* sentences. This experiment has another goal: given the syntactic theory of corrective *but* sentences, these sentences are a great place to study the prosodic structure itself. Results of the prosodic experiment suggest that the prosodic structure of these sentences matches their syntactic structure by replicating the dominance relations in the syntactic structure. This is compatible with a recursive view of the prosodic structure.

The following sections of this introductory chapter describe each of the following chapters respectively. Section 2 presents the syntactic analysis of *either…or…* sentences. Section 3 shows that this analysis of *either* can be extended to *whether* and *neither* with minimal additional assumptions. Section 4 shows that independent evidence suggests that corrective *but* sentences have a nearly identical analysis to *either…or…*, despite their apparent differences, supporting a generalized analysis of all correlative coordination. Section 5 presents a prosodic experiment of ellipsis in coordination that suggests that elided material has prosodic representation, despite being

silent. Section 6 in turn uses prosodic evidence to argue for ellipsis in corrective *but* sentences, and further argues that prosodic structure tracks syntactic structure more closely than some theories previously claimed. Section 7 describes the appendices to this dissertation.

2. Chapter 2: Syntax of *either…or…* sentences

Either has a relatively free distribution with respect to disjunction: while *either* can appear to be adjacent to the apparent disjunction (1a, assuming the apparent disjunction in (1a-d) is *spinach or chard*), it can also appear above the apparent edge of disjunction (1b-d), or embedded inside the first disjunct (6a-b).

(6)a. Max will **either** eat spinach or he will eat chard.
b. Max **either** will eat spinach or he will eat chard.
c. **Either** Max will eat spinach or he will eat chard.

This distribution is puzzling if we assume that *either* coordinates disjuncts–then it should always appear adjacent to the disjunction. Chapter 2 presents syntactic-semantic diagnostics based on constituency tests, elided pronouns and referring expressions, antecedent-contained deletion, and verb particle constructions that suggest that when *either* appears above the apparent edge of disjunction (1b-d), ellipsis has occurred, obscuring the fact that *either* is still at the edge of disjunction in these cases. Ellipsis alone is not enough, however, because it cannot explain sentences where *either* appears to be embedded in the first disjunct (6a-b) because there is nothing to elide.

I resolve this issue by identifying another key property of *either*: it is a focus particle because it must c-command focus. I propose that *either* originates inside the disjunction, c-commanding the focused constituent *spinach*. Then *either* moves to the edge of disjunction. Separately, ellipsis (specifically stripping) can occur to make the disjunction appear smaller than it actually is. Under this analysis, (6a) is a result of covert movement of *either–either* still moves, but its base position is pronounced:

(7) [$_{\text{Disjunct}}$ Either$_i$ Max will either$_i$ eat spinach] or [$_{\text{Disjunct}}$ he will eat chard].

This proposal is interesting because it contributes to the view that all focus particles have two positions in a sentence (e.g., Lee (2004), Cable (2007), Hole (2015), (2017), Hirsch (2017), Quek & Hirsch (2017), and Bayer (2018)), and offers a possible explanation: each position of the focus particle satisfies a grammatical role. In the case of *either*, the lower position marks the position of focus, while the higher position is the daughter of the first disjunct, and tells us the semantic scope of disjunction.

3. Chapter 3: *Whether* and *neither*: Variants of *either* that pied-pipe the disjunction

My proposal for *either* involves its movement to the edge of disjunction. If we can find a variant of *either* that can move further up, and can in addition pied-pipe, then we might see this variant of *either* pied-pipe the disjunction. Chapter 3 argues that *whether* and *neither* are precisely such variants of *either*.

This argument also provides a solution to a puzzle about *whether* and *if*. *Whether* and *if* can both embed alternative questions (8a-b), which might lead us to think that they have similar grammatical properties. However, a long-standing puzzle is that the string *whether or not* is fine (8c), but *if or not* is not (8d) (observed by e.g. Kayne 1991):

(8) a. I don't know whether Pat left or not.
b. I don't know if Pat left or not.
c. I don't know whether or not Pat left.
d. *I don't know if or not Pat left.

I argue that in (8c) *whether* and the disjunction *or not* are one constituent occupying Spec, CP, with *or not* being pied-piped by *whether*. The pied-piping option is not available to *if*-questions because unlike *whether*, *if* is the interrogative head. The counterpart to *whether* in *if*-questions is a covert operator, and covert elements cannot pied-pipe overt material. Then I examine languages that allow pied-piping and those that do not allow pied-piping, exemplified by Polish and Bengali respectively, and show that cross-linguistically, the ability of 'whether' to pied-pipe is directly correlated with whether this language permits its *wh*-phrases to pied-pipe. I also extend the analysis to English *neither*, and argue that *neither* can also pied-pipe disjunction. If this result is correct, not only does it solve the puzzle around *whether* and *if*, but it also resolves the debate about whether *whether* is an interrogative head (Walkden 2014) or a *wh*-phrase (e.g. Larson 1985). *Whether* is a *wh*-phrase because like other *wh*-phrases, it can pied-pipe.

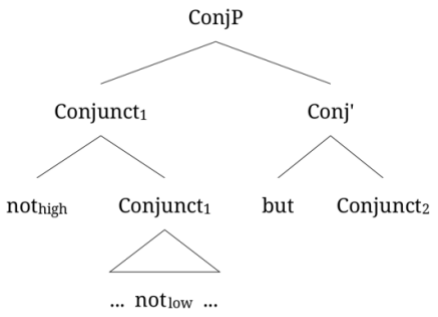
4. Chapter 4: Syntax of corrective *but* sentences

In chapter 4, I show that corrective *but* sentences, a construction that appears to be unrelated to *either…or…* sentences, nevertheless have nearly identical analysis to *either…or…*. Corrective *but* sentences are coordinated by *but*, and require negation in the first conjunct:

(9) a. Max does**n't** eat spinach but chard.
b. Max eats **not** spinach but chard.

I argue with a mix of diagnostics, some of which are replicated from the diagnostics of *either…or…*, and the others are new, that negation has two positions in the sentence: the higher position is the daughter of the first conjunct, and the lower position is deeply embedded inside the first conjunct, and must c-command the leftmost focus.

(10) *Negation has two positions in corrective but sentences*



When negation does not appear to be at the left edge of coordination, as in (9a), ellipsis has occurred to obscure the fact that negation is indeed at the left edge of coordination (Max does**n't** [eat spinach but ~~eat~~ chard]). Either position can be pronounced, but only the higher position is interpreted as actual negation, while the lower position is semantically vacuous.

Corrective *but* sentences appear to be quite different from *either…or…* sentences. One important difference is that the former involves conjunction but the latter involves disjunction. But independent evidence converges on the same analysis for these two types of sentences. This suggests that perhaps all types of correlative coordination have the same syntactic structure: two positions for the coordinator, as in (5). Furthermore, previous analyses have tried to account for some scope facts in disjunctive sentences by claiming that they are a result of the unique properties of disjunction (e.g., Schlenker (2006) and Charlow (2014)). I observe that the scope of conjunction in corrective *but* sentences parallels that in disjunctive sentences in many ways. This suggests that there may be another mechanism that can derive the scope facts in coordination–which I argue is an interaction of ellipsis and focus–and crucially, this mechanism that I argue for should in principle be available to correlative coordination generally.

5. Chapter 5: Elided material has prosodic representation

Previous studies have shown that in English coordination, prosodic structure largely reflects syntactic structure. As a simple illustration, consider these two minimal pair sentences: (a) *They saw Mary and Bill Sawyer, too.*; and (b) *They saw Mary, and Bill saw her too*. One significant difference between them is syntactic constituency, with DP-coordination in (a) and clausal coordination in (b). This syntactic difference is reflected in prosodic constituency: the prosodic boundary between *Mary* and *and* is larger in (b) than in (a). This close correspondence between syntax and prosody makes coordination a great place to study deeper questions of syntax-prosody mapping.

For example, if we follow the intuition that prosodic structure is matched to pronounced material, an obvious place to study the syntax-prosody mismatch is syntactic structure involving non-pronounced material. I use elided material as a case study because it is phonologically empty and nevertheless meaningful. Because elided material is silent, one might expect that it is not represented in prosody.

In chapter 5, I argue with experimental evidence that the presence or absence of elided structure actually has an effect on the prosodic realization. I use fragment answers in coordination as a case study, and contrast surface conjunction of a DP and a PP (11B) with surface conjunction of two DPs (12B).

(11) A: Where did Loretta go and when?
B: McDonald's and on Sunday.

(12) A: Which restaurant and which giftshop did Loretta go to?
B: McDonald's and Walt Disney.

The first answer (11B) must be analyzed as conjunction of two clauses plus ellipsis (13a), while the second answer can be analyzed as DP-conjunction embedded in a single clause (13b):

(13) a. [$_{CoordP}$ McDonald's$_i$ ~~she went to t$_i$~~ and [at midnight]$_j$ ~~she went there t$_j$~~].
b. [$_{CoordP}$ McDonald's and Walt Disney]$_i$ ~~she went to t$_i$~~.

If elided material is not represented in prosody at all, then (11B) and (12B) should have the same prosodic structure because on the surface they both involve coordination of two phrases. If ellipsis has an effect on prosody, then the presence of more elided material in (11B) than in (12B) should lead to larger prosodic phrases in (11B) than (12B), and that prosodic difference should be comparable to the difference between sentences that do not contain any elided material in the first conjunct (i.e., *She went to McDonald's and at midnight* and *She went to McDonald's and Walt Disney*)

Durational results show that prosodic boundaries vary in a direction suggesting that ellipsis affects prosody. This suggests that elided material is present in narrow syntax in order to be mapped onto prosodic structure. It challenges alternative theories which claim that fragment answers do not involve ellipsis at all, or it involves ellipsis, but elided material is not fully present in syntax (either partially present as a pro, or not present at all, but later copied at LF).

Furthermore, not all phonologically empty material has prosodic realization: it has been argued that null heads and their projections and perhaps traces are ignored by the syntax-prosody mapping (Nespor & Vogel 1986; Chen 1987; Truckenbrodt 1999; Elfner 2015). Assuming a derivational account of the syntax-prosody mapping, a possible interpretation of these results is that prosodic phrasing is created at a point when material to be elided is not fully deleted, leaving effects of deleted material in prosody. But at this same moment of creation of prosodic structure, vocabulary insertion has already occurred, so that the syntax-prosody mapping can ignore phonologically null elements.

6. Chapter 6: Prosodic evidence for ellipsis and recursive prosodic structure

6.1. Prosodic evidence for ellipsis in corrective *but* sentences

Since chapter 5 has shown that elided material has prosodic representation, I ask in chapter 6 whether we can use prosodic evidence to argue for ellipsis. I base this work on corrective *but* sentences, a type of sentences that chapter 4 has argued can involve ellipsis using syntactic-semantic arguments.

I focus on sentences like (9b), and compare two competing syntactic analyses of them. One analysis, which I call *the strictly-DP-coordination approach*, argues that (9b) does not involve any ellipsis, and must be analyzed as DP-coordination (14). The other analysis, which I call the *ambiguity approach* and argue for in chapter 4, claims that (9b) is structurally ambiguous between DP-coordination, vP-coordination and TP-coordination (15).

(14) *Strictly-DP-coordination approach*
Max eats [$_{DP}$ **not** spinach] but [$_{DP}$ chard].

(15) *Ambiguity approach*
a. Max eats [$_{DP}$ **not** spinach] but [$_{DP}$ chard].
b. Max [$_{vP}$ eats **not** spinach] but [$_{vP}$ chard$_i$ ~~eats t$_i$~~].
c. [$_{TP}$ Max eats **not** spinach] but [$_{TP}$ chard$_i$ ~~he eats t$_i$~~].

Following the empirical finding that in coordination, a clause is followed by a stronger prosodic boundary than a DP, since in (14) *spinach* is aligned to the right edge of a DP, but can be aligned to the right edge of a clause in (15), the ambiguity approach may predict that on average, the prosodic boundary following *spinach* may be stronger than the boundary following a typical DP. A production experiment confirmed these predictions: the prosodic boundary in participants' productions of corrective *but* sentences systematically varied in a manner consistent with the ambiguity approach, but not the strictly-DP-coordination approach.

6.2. Prosodic structure can be recursive

Not only do the experimental results of chapter 6 inform us about syntactic theories on corrective *but* sentences, but they also shed light on syntax-prosody mapping, specifically on the question of whether the prosodic structure can be recursive like the syntactic structure. In the second part of chapter 6, I focus on the other type of corrective sentences (9a), for which there is a rather uncontroversial syntactic analysis: vP-coordination plus ellipsis.

(16) *The analysis of (9a) according to both approaches*
Max does [$_{vP}$ not eat spinach] but [$_{vP}$ chard$_i$ ~~eat t$_i$~~].

This syntactic structure is recursive because a syntactic maximal projection XP dominates another maximal projection YP. For example, it has a vP that dominates a DP (i.e., [$_{vP}$ not eat [$_{DP}$ spinach]). I ask whether the prosodic structure of this sentence is also recursive, and durational evidence suggests that it is because a vP that dominates a DP corresponds to a stronger prosodic phrase than just a DP. This supports theories of syntax-prosody mapping that allow recursive prosodic structure (e.g., Selkirk (2009), (2011); Elfner (2012), (2015); Bennett et al. (2016); Ito & Mester (2013), (2015)), and challenges those that don't (e.g., Selkirk (1986)).

7. Appendices

Having introduced the main chapters of this dissertation, I want to briefly discuss the three appendices to this dissertation. They are a collection of works that do not directly bear on the research questions, but are nevertheless closely related to them.

Chapters 2–4 show that in correlative coordination, the first coordinator has two positions, but this can be obscured by ellipsis. In those chapters, ellipsis is a veil that sometimes obscures the syntactic structure of coordination, but appendix A puts ellipsis in the spotlight. Appendix A is a collection of notes about ellipsis, and argues following Barros et al. (2014) that ellipsis can take as its antecedent a "short source"–a subpart of the previous clause rather than the entire clause. This short source can lead to the appearance that ellipsis can evade island constraints, but I argue that in fact there is no island in the short source, and therefore no island evasion. In addition, appendix A also studies stripping, the ellipsis that chapters 2 and 4 argue can occur in correlative coordination. Contrary to the previous assumption in the literature that stripping must delete a full clause (i.e., a TP or a CP), I show that it can actually delete constituents that are smaller than a TP (e.g., a vP). While in appendix A, this claim is limited to just stripping, I think it can potentially be extended beyond stripping to other types of ellipsis that were previously assumed to involve deletion of a TP or a CP (e.g., sluicing). If those types of ellipsis like sluicing can delete a phrase smaller than a TP (e.g., a vP), then we could explain the mismatch that was observed there (e.g.,

Rudin (2019), Anand et al. (2021), Ranero (2021))–perhaps it is not mismatch after all, but an illusion due to the fact that elided material can be smaller than previously thought.

Chapters 5–6 study the prosodic structure of coordination by studying how the syntactic size of the coordinated phrases affects prosodic boundaries. But there is a confound in these studies–focus: it just so happens that in those experiments, as I vary the syntactic size of coordination, the focus structure also varies. Appendix B presents a separate experimental study that just looks at the prosodic effects of focus, and asks whether focus can alter the prosodic boundary in English, a question that has not been studied experimentally before to my knowledge. Analysis of materials of a previous experiment by Wagner et al. (2010) does not find any effect on prosodic boundary due to focus.

Appendix C presents a prosodic study of *either…or…* sentences that is inconclusive because it requires further understanding of the syntax of focus-sensitive operators and how it may affect processing and speech production, questions that have not been studied before. While the pilot study to the prosodic experiment showed promising results, the following large-scale experiment had surprising results that are not expected under any syntactic theory and theory of syntax-prosody mapping. Still, I want to report the results of this experiment, in the hope that they might shed light on unsolved puzzles about the syntax and prosody of correlative coordination.

Chapter 2[1]
Syntax of *either* in *either*…*or*… sentences

1. Introduction

This chapter proposes an analysis of the syntax of *either* in *either* … *or* … sentences. Consider the placement of *either* in examples like (1):

(1)John will eat either rice or beans.

An obvious expectation to entertain concerning the position of *either* is that it might always appear as the sister of a disjunction phrase (c.f. Quine 1967; p.44; Dougherty 1970; Stockwell et al. 1973; Neijt 1979; Sag et al. 1985). In (1), if we assume that *rice or beans* is a disjunction phrase (*DisjP*), and *rice* and *beans* are the *disjuncts*, then *either* does appear adjacent to this DisjP and is its sister:

(2)John will eat either [$_{\text{DisjP}}$ rice or beans].

As Larson (1985), Schwarz (1999), and den Dikken (2006), among others have observed, this view that *either* must be the sister of DisjP is challenged by examples like the following:

(3)a. John will either eat rice or beans.
b. John either will eat rice or beans.
c. Either John will eat rice or beans.

(4)a. John will either eat rice or he will eat beans.
b. John either will eat rice or he will eat beans.

Assuming that DisjP is still *rice or beans* in (3a-c), *either* is higher than the sister of DisjP and separated from the DisjP by overt material. For this reason, I call examples like (3a-c) *either-seems-high* sentences, adapting den Dikken's (2006) terminology. In (4a-b), the DisjP coordinates two TP clauses, and *either* appears to be embedded in the first disjunct. Because *either* appears lower than the sister of DisjP in (4a-b), I call such examples *either-seems-low* sentences. *Either*-seems-high and *either*-seems-low sentences apparently violate the generalization that *either* is always the sister of a disjunction. In contrast, I call sentences like (2) *either*-seems-normal sentences for the reason that *either* seems to be in its "normal" position, that is the sister of DisjP. This chapter will present an analysis of *either*-seems-normal, *either*-seems-high and *either*-seems-low sentences.

I will argue, following previous proposals by Schwarz (1999) and Han and Romero (2004) that *either*-seems-high sentences are an illusion created b ellipsis. *Either* is the sister of DisjP, and when it seems high, ellipsis has applied in the noninitial disjuncts.

Ellipsis alone is not enough, however. It cannot account for *either*-seems-low sentences because there is nothing to elide there. It also cannot explain some other observations about *either*. Observations made by den Dikken (2006) involving islands suggest that *either* moves.

[1] This chapter has been published as Wu (2022a) in *Natural Language and Linguistic Theory*.

Additionally, there are scope facts observed by Larson (1985) that pose difficulty to an analysis involving only ellipsis.

For these reasons I argue that in addition to ellipsis, *either* also moves (following Larson (1985) and Johannessen (2005) but differing in the starting and ending points of the movement). It moves from a position inside the DisjP to the sister of the DisjP. This movement explains the island facts. And as I will explain later, movement of *either* together with ellipsis accounts for the scope facts. Also, this movement of *either* can be either overt or covert. When it is covert, we get *either*-seems-low sentences.

This proposal is schematized below. *Either* moves from inside the DisjP to the sister of DisjP. When *either* seems higher than the sister of DisjP, ellipsis has applied to the second disjunct, creating the illusion that DisjP is smaller than it actually is, and *either* is higher than it actually is.

(5)Either$_i$ [$_{DisjP}$ [$_A$ t$_i$ X …] or [$_B$ ~~X~~ …]]

According to this analysis, *either*-seems-high sentences (3a-c) result from the combination of movement of *either* to the edge of DisjP, pronunciation of *either* in its higher position, and ellipsis. The elided parts are illustrated below. *Either* in all these sentences is pronounced next to DisjP, and is therefore the sister of the DisjP:

(6)a. John will either [$_{DisjP}$ eat rice or ~~eat~~ beans].
b. John either [$_{DisjP}$ will eat rice or ~~will eat~~ beans].
c. Either [$_{DisjP}$ John will eat rice or ~~John will eat~~ beans].

As we have seen, in *either*-seems-high sentences *either* is pronounced in its derived position–an instance of overt movement. By contrast, the *either*-seems-low sentences are a result of pronouncing *either* in its base position, an instance of covert movement. When the movement of *either* is covert, *either* is pronounced in its base position (bold font indicates the pronounced copy from now on), creating *either*-seems-low sentences:

(7)a. Either$_i$ John will **either$_i$** eat rice or he will eat beans.
b. Either$_i$ John **either$_i$** will eat rice or he will eat beans.

Having presented the proposal and how it applies to example sentences, it is important to mention that this proposal is a hybrid, combining elements from previous proposals in the literature, but also differing from them in important ways. Some of the empirical observations about ellipsis and the idea that *either*-seems-high sentences are derived from ellipsis come from Schwarz (1999) and Han and Romero (2004), but the proposal differs from them in arguing that this ellipsis is stripping, not gapping. The empirical observations about islands and scope, and the idea that *either* moves come from Larson (1985) and Johannessen (2005), but the proposal differs from them in the starting and ending points of *either*'s movement. The empirical observation about *either*-seems-low sentences were first made by Larson (1985), and developed further by den Dikken (2006), but I differ from den Dikken in exactly where *either* is base-generated relative to the focus. In addition, I will discuss a few other proposals that have not been raised before to my knowledge but are logical possibilities, and why they are insufficient. Discussion of the previous proposals and other alternatives is dispersed throughout the chapter.

There has been a debate in the literature about exactly what *either* is syntactically. Some argue that it is a disjunction coordinator (e.g. Gazdar et al. 1985, Grootveld 1994, Larson 1985, Neijt 1979, Sag et al. 1985, and Schwarz 1999), while others argue explicitly against this view, and claim instead that *either* is a focus-sensitive operator (e.g. Hendriks 2001, 2003; Johannessen 1998, 2005; and Zhang 2008). This chapter argues that *either* is both, and each of the two positions proposed in this chapter realizes a role: *either*'s base position realizes its role as a focus-sensitive operator, while its derived position marks the left edge of disjunction.

Sections 2–5 each presents an empirical generalization concerning *either…or…* sentences, each generalization motivating a component of the current analysis. The generalizations involve evidence for ellipsis, islands, scope and *either*-seems-low sentences respectively.

This chapter not only provides an analysis of the element *either*, but it also relates to a broader generalization about all focus-sensitive operators. As I will show in section 5, *either* must c-command focus, which is the key property of a focus-sensitive operator. If *either* is a focus-sensitive operator, then it should have the property that all focus-sensitive operators have.

Cross-linguistic analyses of focus-sensitive operators have suggested that perhaps all focus-sensitive operators have two instances in the structure that relate to each other by agreement and/or movement (e.g. Lee 2004; Cable 2007; Hole 2015; 2017; Bayer 2016; Hirsch 2017; and Quek and Hirsch 2017).

If this cross-linguistic generalization is true, and if *either* is a focus-sensitive operator, it should also occupy two positions in the structure. This is precisely what my proposal argues for: *either* has two positions that are related by movement. If this analysis is on the right track, then it adds another data point, *either*, to the universal generalization.

In the concluding section 6 I compare *either* to other focus-sensitive operators, and raise further questions regarding the focus-sensitivity of *either*, such as why *either* is sensitive to the leftmost focus but not the other foci. Section 7 is an appendix that discusses the exceptionally wide scope of disjunction.

2. Ellipsis

This section presents five arguments that show that *either*-seems-high sentences are derived by ellipsis in the second disjunct. The first argument claims that ellipsis is necessary to explain disjunction of apparent non-constituents. The second and third arguments show that there are ellipsis-related phenomena in *either*-seems-high sentences involving a reading called "the sloppy identity" and Principle B. The fourth argument shows that ellipsis can explain the phenomenon of antecedent-contained deletion in *either*-seems-high sentences, whereas a non-ellipsis account can't. The last argument is replicated from Schwarz (1999) and Han and Romero (2004), and shows that ellipsis is necessary to explain the observed facts about verb particle constructions. The first four arguments show that ellipsis must be available to *either*-seems-high sentences, but do not rule out the possibility that *either*-seems-high sentences can have another analysis at the same time that does not rely on ellipsis. The fifth argument is stronger in that it not only argues for the necessity of ellipsis, but also that ellipsis is the only analysis. Subsections 2.1 to 2.5 present these arguments respectively.

These arguments show that the highest position for *either* is in Spec, DisjP. When *either* appears higher, ellipsis has occurred in the second disjunct, creating the impression that the DisjP is smaller than it actually is, and therefore *either* is higher than it actually is. (8a) is an *either*-seems-high configuration, and (8b) is argued to be its deep structure:

(8)a. … either … X … [$_{DisjP}$ A or B]
b. … [$_{DisjP}$ either [$_{Disj'}$ … X … A or ~~… X …~~ B]]

After arguing for the existence of ellipsis, I will investigate what kind of ellipsis it is in subsection 2.6. Contra Schwarz (1999) and Han and Romero (2004), I will argue that the ellipsis is stripping (also known as "bare argument ellipsis") rather than gapping.

2.1. Argument 1 for ellipsis: Disjunction of "non-constituents"

The first argument for ellipsis relies on a simple assumption: only constituents can be disjoined. This is schematized below:

(9)[$_{DisjP}$ A or B] is well-formed only if A is a constituent and B is also a constituent

Suppose this is true for all disjunctions. If we see a grammatical disjunction in which the apparent second disjunct is not a constituent, there must be ellipsis in the second disjunct, so that before ellipsis it is a constituent. This is schematized below. C is what surfaces in the second disjunct. While C may not be a constituent on its own, when ellipsis of X is undone, X and C together must be a constituent.

(10) [$_{DisjP}$ A or [$_{B}$ ~~X~~ C]] only if A is a constituent and B is also a constituent

To illustrate this with examples, first consider the following sentence:

(11) John either looked at the planet with ice caps or the star with dark spots.

The two disjuncts in this sentence are *the planet with ice caps* and *the star with dark spots*. Both are constituents and DPs. It satisfies the requirement that disjuncts must be constituents.

Now consider the following grammatical sentence. It is a minimal pair with the above sentence, differing only in the PP. Here the PPs *with a telescope* and *with binoculars* are instrumental phrases that modify the verb, and they do not form a constituent with the preceding nouns. In other words, the apparent second disjunct *the star with binoculars* is not a constituent.[2]

(12) John either looked at the planet with a telescope or the star with binoculars.

This apparently violates the generalization that disjuncts must be constituents. But we can in fact maintain this generalization if we posit ellipsis in the second disjunct. Below are the two possible derivations for this sentence:

[2] As two Natural Language & Linguistic Theory (NLLT) reviewers pointed out, the only way that *the star with binoculars* could be a constituent is if the sentence involves VP disjunction and ATB-movement of V (*looked*) and the preposition (*at*) out of the disjunction:

(i) John looked$_i$ at$_j$ either [$_{VP}$ t_i t_j the planet with a telescope] or [$_{VP}$ t_i t_j the star with binoculars].

While it is possible that V (*looked*) ATB-moves to v, it is unlikely that there is another head position below v that the preposition can move to, so *the star with binoculars* can't be a constituent.

(13) a. John either looked at the planet with a telescope or ~~looked at~~ the star with binoculars.
b. John either looked at the planet with a telescope or ~~he looked at~~ the star with binoculars.

Once ellipsis is undone, now the second disjunct does form a constituent: *looked at the star with binoculars*, or *he looked at the star with binoculars*.

Similarly, the apparent disjunct can be a direct object plus a temporal adjunct (e.g. *chess yesterday* in (14a)), which as Hirsch (2017) argued for conjunction, cannot be one constituent. This again suggests that there is additional covert structure (derivation in (14b)):[3]

(14) a. Mary either played checkers today or chess yesterday.
b. Mary either played checkers today or ~~played~~ chess yesterday.

Therefore, ellipsis is necessary if we want to maintain the plausible generalization that only constituents can be disjoined.[4]

2.2. Argument 2 for ellipsis: Sloppy identity

The second argument for ellipsis in *either*-seems-high sentences is based on the sloppy identity of elided pronouns.

Ross (1967) found that an elided pronoun can either refer to the referring expression in the antecedent or the one in the constituent that survives ellipsis ("the remnant"). Consider the stripping example (15), which, following the standard analysis of stripping (e.g. Depiante 2000; Merchant 2003, 2004; Wurmbrand 2013), involves movement of the remnant (*Bill*) out of elided phrase plus deletion of the TP in the second conjunct. (15) has two readings. In the analysis of the first reading (15a), the elided pronoun refers to *John*, leading to the strict reading; in the second reading (15b), the elided pronoun refers to *Bill*, leading to the sloppy reading:

(15) John likes his mother, and Bill too.
a. John$_i$ likes his$_i$ mother, and Bill$_i$ ~~t$_i$ likes his$_i$ mother~~ too. *strict reading*
b. John$_i$ likes his$_i$ mother, and Bill$_i$ ~~t$_i$ likes his$_j$ mother~~ too. *sloppy reading*

If *either…or…* sentences involve ellipsis (specifically stripping, which I will argue for later), and there is a pronoun in the elided phrase, then this pronoun must lead to ambiguity, too.[5] This

[3] In addition, Collins (1988) and Bogal-Allbritten & Weir (2017) discussed the use of other adverbs in conjunction such as *perhaps*, which applies to *either*-seems-high sentences and provides evidence for ellipsis as well.

[4] The ellipsis-based analysis would claim that in *either*-seems-high sentences, what appears to be surface disjunction will never be one constituent in the underlying structure.

[5] As an NLLT reviewer pointed out, non-elliptical sentences can have sloppy identity, and thus sloppy identity readings have been suggested to not be a reliable diagnostic of ellipsis (Merchant 2013):

(i) a. Ralph ate his ice-cream with a spoon, and Seymour did the same thing.
b. Harvey stubbed his toe on the doorstop, and it happened to Max, too. (Merchant 2013:5)

The non-elliptical sentences that have the sloppy identity reading all involve lexical items such as *the same thing*, *likewise* and overt pronouns. I take this to indicate that the sloppy identity reading requires ellipsis or such a lexical item. Since the second disjunct in the *either…or…* sentence in (16) does not involve any such lexical item, it must involve ellipsis.

prediction is borne out. (16) has both the strict reading (16a) and the sloppy one (16b). I underline the constituents that contrast with each other for clarity.

(16) Mary either expects <u>John</u> to like his mother, or <u>Bill</u>.
a. Mary either expects John$_i$ to like his$_i$ mother, or ~~expects~~ Bill ~~to like his$_i$ mother~~.
b. Mary either expects John$_i$ to like his$_i$ mother, or ~~expects~~ Bill ~~to like his$_j$ mother~~.

2.3. Argument 3 for ellipsis: Principle B

The third argument for ellipsis comes from Principle B (inspired by Kitagawa's 1991 and Fiengo & May's 1994 analysis for VP-ellipsis). First, the following contrast is a baseline and illustrates Principle B:

(17) a. *Either Mary voted for him$_i$, or John$_i$ voted for him$_i$.
b. Either Mary voted for him$_i$, or John$_i$ voted for her.

Example (17a) is ungrammatical because in the second disjunct, *John* c-commands and is co-indexed with the pronoun *him*, which violates Principle B. (17b) is improved because the pronoun in the second disjunct does not refer to *John*.

Consider (18a). It is ungrammatical presumably because it involves ellipsis (18b), and Principle B is violated in the ellipsis site. Contrasted phrases are underlined.[6]

(18) a. *Either <u>Mary</u> voted for him$_i$, or <u>John$_i$</u>.
b.*Either <u>Mary</u> voted for him$_i$, or [<u>John$_i$</u>] ~~John$_i$ voted for him$_i$~~.

2.4. Argument 4 for ellipsis: Antecedent-contained deletion

The fourth argument for ellipsis in *either*-seems-high sentences involves antecedent-contained deletion (ACD). The common analysis of ACD requires quantifier raising (QR) of a DP containing the ellipsis site in order to construct an antecedent VP that is parallel to the elided phrase (Sag 1976; May 1985; Kennedy 1997; Fox 2002). Consider the baseline example (19). The universal quantifier (*every philosopher that Mary did*) must QR above the matrix VP to make the antecedent (A; *talked to t*) parallel to the elided phrase (E; *talked to t*).

[6] The reader might notice that (18a) can be improved with some changes:

(i) Either <u>Mary</u> voted for John$_i$, or <u>he$_i$ himself.</u>

This may be surprising under the ellipsis-based analysis because in the ellipsis site *John* is c-commanded by a co-indexed pronoun, and thus violates Principle C:

(ii) Either Mary voted for John$_i$ or [he$_i$ himself] ~~he$_i$ himself voted for John$_i$~~.

This fact has actually been observed for other cases of ellipsis, such as VP-ellipsis and stripping. Fiengo and May (1994) argued that ellipsis allows for a process called vehicle change, where a pronoun may occur instead of an R-expression in the elided phrase. If the *either…or…* sentence in (i) involves ellipsis, then vehicle change should be available to it as well. This explains its grammaticality.

(19) a. John talked to every philosopher that Mary did.
b. John [every philosopher that Mary did [$_E$ ~~talk to t~~]]$_i$ [$_A$ talked to t_i].

Kennedy (1994) observed that the direct objects of the overtly expressed verb and the elided verb in ACD must be identical. Following is the relevant contrast, and I added the elided verbs:

(20) a. Polly visited every town Erik did ~~visit~~.
b. *Polly visited every town in a country Erik did ~~visit~~. (Kennedy 1994:2)

In (20a) the direct objects of the overtly expressed verb and the elided verb are both *every town*. In (20b) the direct object of the overtly expressed verb is *every town located in a country*, while the direct object of the elided verb is *a country*.

The phrase containing the elided VP is usually an adjunct such as a relative clause, and it attaches to a DP. If we adopt the analysis of ACD outlined above which involves QR of DP, we can restate Kennedy's generalization as the following: the DP that the relative clause attaches to must QR in order to license ACD, but not any DP larger than that. Following are the analyses of (20a-b) respectively:

(21) a. Polly [every town Erik did [$_E$ ~~visited t~~]]$_i$ [$_A$ visited t_i].
b. *Polly [a country Erik did [$_E$ ~~visited t~~]]$_i$ [$_A$ visited every town in t_i].

In (21a) the DP that the relative clause attaches to that must QR is *every town Erik did*, and the antecedent (*visited t*) is parallel to the elided phrase (*visited t*). In (21b) the DP that the relative clause attaches to that must QR is *a country Erik did*, and the antecedent (*visited every town in t*) is not parallel to the elided phrase (*visited t*). If the larger DP (*every town in a country Erik did*) could QR instead, we would get an antecedent that is parallel to the elided phrase:[7]

(22) *Polly [[every town in a country]$_j$ Erik did [$_E$ ~~visited t$_j$~~]]$_i$ [$_A$ visited t_i].

The fact that (20b) is ungrammatical suggests that only the DP that the relative clause attaches to can QR to license ACD. Now I will discuss *either*-seems-high sentences that involve ACD. Kennedy's generalization will be important in that given his generalization, it will be difficult to analyze *either*-seems-high sentences involving ACD without ellipsis.

Consider the *either*-seems-high sentence (23), which appears to disjoin an indefinite and a universal quantifier containing ACD on the surface.

(23) John either talked to a linguist or every philosopher that Mary did.

I will now evaluate two competing analyses of (23). One analysis is the current proposal, and posits ellipsis of *talked to* in the second disjunct (24a). The underlying disjunction is a disjunction of two vPs/T's. The other analysis claims that there is no ellipsis, and what we see is what we get (24b). The underlying disjunction is a disjunction of two DPs.

[7] There are proposals in the literature for exactly why the derivation in (22) is not possible. See Sauerland (1998) and Fox (2002), for example, for an analysis that depends on the copy theory of movement.

(24) a. John either [$_{DisjP}$ talked to a linguist or ~~talked to~~ every philosopher that Mary did].
there is ellipsis
b. John either talked to [$_{DisjP}$ a linguist or every philosopher that Mary did]. *no ellipsis*

I will show that the ellipsis-based account in (24a) offers a straightforward account of (23), while the other account in (24b) doesn't. First, let us consider the account in (24b). The relative clause in (23) attaches to the universal quantifier *every philosopher*. Following Kennedy's generalization, only this universal quantifier can QR to license ACD, but not the entire disjunction *a linguist or everyone that Mary did*. If we only QR the universal quantifier, we will violate the Coordinate Structure Constraint (CSC), which bans movement out of the coordinated structure. Even if we could do that, we will not be able to license ACD:

(25) *The non-ellipsis account cannot license ACD*
John either [every philosopher that Mary did [$_{E}$ ~~talk to t~~]]$_i$ [$_{A}$ talked to [$_{DisjP}$ a linguist or t_i]].

The antecedent A is *talk to a linguist or trace*, but the elided phrase is *talk to trace,* and they are not parallel enough to license ellipsis. Thus, the non-ellipsis account cannot explain (23).

In contrast, (23) can have a straightforward account if we posit ellipsis. Suppose two matrix T's are coordinated. (23) can be derived if we propose QR of the indefinite in the first disjunct (to resolve the type mismatch), and QR of the universal quantifier in the second disjunct (to license ACD) (I leave out the deletion lines for ease of demonstration):

(26) *The ellipsis-based account manages to derive (23)*
John either [$_{DisjP}$ [a linguist]$_i$ talked to t_i or [everyone that Mary did]$_j$ talked to t_j].

Thus, given Kennedy's generalization about ACD, the ellipsis-based account can account for *either*-seems-high sentences involving ACD, while the non-ellipsis account can't.

2.5. Argument 5 for ellipsis: Verb particle constructions

This section summarizes the argument from Schwarz (1999) and Han and Romero (2004) for ellipsis. The argument is based on a comparison of a few competing alternatives. I will compare the ellipsis-only account by Schwarz and Han and Romero with Munn's (1993) overt quantifier raising (QR) account and the movement-only account by Larson (1985) and Johannessen (2005).

Let me first explain each account using the following *either*-seems-high example:

(27) John will either eat rice or beans.

According to the ellipsis-only account, *either* is always in Spec, DisjP, but ellipsis may take place in the second disjunct, so that DisjP is bigger than it appears (28a). In contrast, the overt QR account and the movement-only account contend that there is no ellipsis at all. Under both accounts, *either* moves overtly from Spec, DisjP to its surface position (28b). They differ in exactly what this movement is. The overt QR account claims that *either* is a quantifier and its movement is overt QR, while the movement-only account claims that it is a regular movement.

(28) a. John will either [$_{DisjP}$ eat rice or ~~eat~~ beans].
b. John will either$_i$ eat t_i [$_{DisjP}$ rice or beans].

Schwarz (1999) has argued based on evidence from verb particle constructions that *either*-seems-high sentences are derived by ellipsis, not movement. First, consider the puzzle below: when *either* precedes the TP, the sentence is degraded compared to preverbal *either*.

(29) a. ??Either this pissed Bill or Sue off. (Schwarz 1999:360)
b. This either pissed Bill or Sue off. (Schwarz 1999:357)

Both (29a-b) are *either*-seems-high sentences, and Schwarz and Han and Romero would analyze them as containing ellipsis in the second disjunct. A unique and important fact about (29a-b) is that they involve verb particle constructions, and the particle only appears in the second disjunct. Schwarz (1999) argues that the particle *off* is Right Node Raised (*RNRed*) out of each disjunct:

(30) This either pissed Bill t_i or Sue t_j off$_{i,j}$.

Then (29a) is degraded because the particle resists RNR there:

(31) ??Either this pissed Bill t_i or Sue t_j off$_{i,j}$.

The observation can then be phrased as: RNRing the particle is good when *either* is pre-verbal, but degraded when *either* is pre-TP.

Suppose for now that there is ellipsis in the second disjunct in these two sentences just as Schwarz and Han and Romero have argued. Interestingly, the non-elliptical versions have the same level of goodness / degradation as their elided counterparts:

(29a') ??Either this pissed Bill or it pissed Sue off. (Schwarz 1999:359)
(29b') This either pissed Bill or pissed Sue off.

Schwarz assumes that the particle *off* is also RNRed out of each disjunct in (29a'-b'). Then his conclusion based on (29a'-b') is that RNRing a bare particle to a position above TP is more degraded than RNRing the particle just above VP.

This conclusion can account for the puzzle in (29a,b) if we allow the ellipsis-only analysis. Because *either* is always in Spec, DisjP, its position marks the actual size of the disjuncts. In (29a) it is adjacent to TP, so the disjuncts are TP, and the particle moves across the second disjunct, which is a TP:

(32) ??Either [$_{TP}$ this pissed Bill t_i] or [$_{TP}$ ~~this pissed~~ Sue t_j] off$_{i,j}$.

In (29b) *either* is adjacent to VP, so the disjuncts are VP, and the particle moves across the second disjunct, which is a VP:

(33) This either [$_{VP}$ pissed Bill t_i] or [$_{VP}$ ~~pissed~~ Sue t_j] off$_{i,j}$.

Thus, the puzzle in (29a-b) is correlated with the size of the constituent that the RNR'ed particle moves across. The particle moves across the second disjunct, so the size of the disjunction determines whether RNRing the particle is possible. If the disjuncts out of which RNR takes place are TPs, RNRing the particle is degraded. If the disjuncts are VPs, RNRing the particle is fine. And whether this disjunct is a TP or a VP is marked by the position of *either*. Because *either* is in Spec, DisjP, its sister is the DisjP.

Imagine that instead of staying in Spec, DisjP, there is a variant of *either* that moves away from Spec, DisjP. If this is the case, the surface position of this variant of *either* is no longer an indicator of the size of the disjuncts. *Either*'s *wh*-counterpart *whether* is precisely such an element that can move away from Spec, DisjP. Literature generally assumed that *whether* is *either* with an additional *wh*-feature (e.g. Larson 1985, Han and Romero 2004, den Dikken 2006). Then *whether* and *either* should have almost the identical derivational history in syntax (originating in Spec, DisjP), except that *whether* requires an extra movement step to the CP domain.[8]

Because *whether* always moves from Spec, DisjP overtly to Spec, CP, just from its surface position in Spec, CP, we do not know where it moves from or what the actual disjuncts are. Thus, there is always a possible parse of a *whether*-sentence whose disjuncts are smaller than TP, and it is fine to RNR the particle. This prediction is borne out, as Schwarz and Han and Romero have observed that replacing *either* with its *wh*-counterpart *whether* improves the sentence:

(34) I wonder whether this pissed Bill or Sue off. (Schwarz 1999:368)

As Han and Romero have pointed out, the reason for the acceptability of (34) is that it can have the following parse. In this parse, what are actually disjoined are two VPs, with the repeated main verb being deleted in the second disjunct. *Whether* moves from the specifier of this DisjP to Spec, CP. Because what are disjoined are two VPs, it is fine to RNR the particle *off* across the second disjoined VP.

(35) I wonder whether$_i$ this [$_{DisjP}$ t_i [$_{VP}$ pissed Bill t_j] or [$_{VP}$ ~~pissed~~ Sue t_k]] off$_{j,k}$.

Having shown how the ellipsis story accounts for the puzzle successfully, I will briefly discuss the inadequacy of Munn's (1993) overt QR account, and Larson's (1985) and Johannessen's (2005) movement-only account. According to their analysis, there is no ellipsis in *either*-seems-high sentences, so the DisjP is what we see. The reason why *either* can appear higher than Spec, DisjP is because it QRs/moves from Spec, DisjP to its surface position.

First, the overt QR account fails to explain why (29a) is degraded. It would analyze (29a) as QRing of *either* to the TP, and the degradation of (29a) suggests that QRing from a position sandwiched between the verb and the particle to Spec, TP is not so good. However, as Schwarz pointed out, it is fine to have covert QR out of this position. The following example has the inverse scope reading, which must be generated by QRing the universal quantifier from the sandwiched position to TP.

(36) Something pissed every guest off. (✓∀ > ∃; Schwarz 1999:349)

[8] Chapter 3 argues precisely for this point.

Larson's and Johannessen's movement-only account would attribute the contrast between (29a,b) to the following: when a particle is RNRed, somehow *either* cannot move to as high as the TP domain, but it can still move to VP:

(37) a. ??[$_{TP}$ Either$_i$ this pissed t_i [$_{DisjP}$ Bill t_j or Sue t_k] off$_{j,k}$].

b. This [$_{VP}$ either$_i$ pissed t_i [$_{DisjP}$ Bill t_j or Sue t_k] off$_{j,k}$].

However, this analysis has two problems. First, it cannot explain why (29a') is just as degraded as (29a). In (29a') *either* has not moved because it is already in Spec, DisjP. Second, the movement analysis cannot account for the *whether* example in (34) because there is no flexibility in the starting position of *whether*. It has to start from Spec, DisjP, immediately before *Bill*. This would be the same as *either*'s starting position in (29a-b). If (37a) is degraded because *either* can't move so high to the TP domain, it is puzzling why *whether* can move even higher to the CP domain.[9]

(38) I wonder [$_{CP}$ whether$_i$ this pissed t_i [$_{DisjP}$ Bill t_j or Sue t_k] off$_{j,k}$].

2.6. The ellipsis is stripping

The previous five subsections have argued that ellipsis derives *either*-seems-high sentences, that is (39a) is derived from (39b). The next question is what kind of ellipsis it is. Contra Schwarz (1999) and Han and Romero (2004), I will argue that it is stripping rather than gapping.[10]

(39) a. … either … X … [$_{DisjP}$ A or B]
b. … either [$_{DisjP}$ … X … A or ~~… X …~~ B]

Note that I do not exclude the possibility that gapping (and other types of ellipsis) can occur in *either … or …* sentences. The question of concern here is what kind of ellipsis derives *either*'s high appearance, that is, what is the deletion mechanism in (39b).

Let us call this ellipsis *X*. I will show that X is less restricted than gapping on the one hand, but has identical behavior to stripping on the other hand. First, I will show that both X and stripping can do what gapping cannot do. Then I will show that what X cannot do, stripping cannot either. Based on this I argue that X is stripping, and adopt the standard analysis of stripping for *either*-seems-high sentences. I will briefly discuss how this analysis accounts for the observed facts about stripping.

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[9] An NLLT reviewer pointed out a natural extension of Larson's account, that is *either*-seems-high sentences involve a combination of movement of *either* and ellipsis. For example, (29a) may involve disjunction of two vPs, with ellipsis of the second verb plus movement of *either*:

(i) [$_{TP}$ Either$_i$ this [$_{DisjP}$ t_i pissed Bill t_j or ~~pissed~~ Sue t_k] off$_{j,k}$].

This hybrid analysis still fails to explain the contrast between (29a&b) because if (29a) can be analyzed as vP-disjunction, it should be fine to RNR the particle out of the vPs, contrary to fact. Therefore, the verb particle constructions are evidence against any theory where *either* in *either*-seems-high sentences is derived by movement, whether or not ellipsis is additionally available.

[10] I am grateful to an NLLT reviewer for first suggesting stripping as a possibility to me.

2.6.1. Gapping cannot do what X can do, but stripping can

First, gapping cannot delete part of a preposition phrase and leave the rest:

(40) *Gapping*
a. Charley coughed outside the kitchen and Jill ~~coughed~~ outside the foyer.
b. *Charley coughed outside the kitchen and Jill ~~coughed outside~~ the foyer.
c. *Charley coughed outside the kitchen and Jill ~~coughed outside the~~ foyer.
(Based on Hankamer 1979:18)

X and stripping can delete part of a preposition phrase:

(41) *X*
a. Charley either wrote with a pencil or ~~wrote with~~ a pen.
b. Charley either wrote with a pencil or ~~wrote with a~~ pen.

(42) *Stripping*
a. Charley wrote with a pencil, not a pen.
b. Charley wrote with a pencil, not pen.

Gapping cannot elide a portion of an object DP:

(43) *Gapping*
a. *Charley wrote several books on syntax and Jill ~~wrote several~~ papers on semantics.
b. *Charley wrote several books on syntax and Jill ~~wrote several books on~~ semantics.
(Based on Johnson 2014:13)

X and stripping can elide a portion of an object DP:

(44) *X*
a. Charley either wrote several books on syntax or ~~wrote several~~ papers on semantics.
b. Charley either wrote several books on syntax or ~~wrote several books on~~ semantics.

(45) *Stripping*
a. Charley wrote several books on syntax, not papers on semantics.
b. Charley wrote several books on syntax, not semantics.

Gapping cannot elide a part of a predicate, an object PP or an AdvP:

(46) *Gapping*
a. *Some appeared almost happy and others ~~appeared almost~~ rich.
b. *Some talked only to Smith and others ~~talked only~~ to Jones. (Johnson 2014:15)
c. *Some left extremely quickly and others ~~left extremely~~ sneakily.

X and stripping can delete a part of a predicate, an object PP or an AdvP:

(47) *X*
a. John either appeared almost happy or ~~appeared almost~~ rich.
b. John either talked only to Smith or ~~talked only~~ to Jones.
c. Either Charley left extremely quickly or ~~he left extremely~~ sneakily.

(48) *Stripping*
a. John appeared almost happy, not rich.
b. John talked only to Smith, not to Jones.
c. Charley left extremely quickly, not sneakily.

Because X is less restrictive than gapping, I assume it is not gapping.

2.6.2. Stripping cannot do what X cannot do

Having shown that stripping can do what X can do, now I will show that what X cannot do, stripping cannot do it either.

First, if the constituent that survives X or stripping (*remnant* of X or stripping) contains a preposition, it must be identical to that of the correlate. The preposition cannot be replaced by the semantically empty preposition *of*, suggesting that there is a selectional relation between the verb in the elided structure and the remnant PP:

(49) John either relies on Mary or {on/*of} Susan. *X*

(50) John relies on Mary, but not {on/*of} Susan. *Stripping*
(Yoshida et al. 2015:333)

Second, in languages that do not allow preposition stranding, the remnant of X must contain the preposition adjacent to the object DP. Hebrew, for example, does not allow preposition stranding in *wh*-questions:

(51) *Mi David diber im?
Who David talked with
'Who did David talk to?' Wh-*question*
(Depiante 2000:108)

The preposition of a PP object must occur in the remnant of X. I assume that in the following example, the first *o* 'or' is equivalent to English *either*.

(52) David diber o im Maria o *(im) Yael
David talked either with Maria or with Yael
'David talked either with Maria or with Yael.' *X*
(I. Bassi, p.c.)

The preposition of a PP object must occur overtly in the stripping remnant as well:

(53) David diber im Maria, aval lo *(im) Yael
David talked with Maria but not with Yael
'David spoke with Maria but not with Yael.' *Stripping*
(Depiante 2000:108)

Likewise, Greek does not allow preposition stranding in *wh*-questions:

(54) *Pjohn milise me?
Who spoke with?
'Who did s/he speak with?' Wh-*question*
(Depiante 2000:108)

The preposition of a PP object must occur in the remnant of X. Again, I assume that in the following example the first *i* 'or' is the equivalent of English *either*:

(55) I Ana i milise me ton Alec i *(me) tin Katerina
the Anna either spoke with the Alec or with the Katerina
'Anna either spoke with Alec or with Katerina.' *X*
(S. Iatridou, p.c.)

The remnant of stripping must contain the preposition of a PP object as well:

(56) I Anna doulevi stopanepistimio kai ochi *(stin) IBM
'Anna works in the university, and not *(in) IBM.' *Stripping*
(Depiante 2000:108)

To preview the analysis for this fact, Depiante takes this as evidence that the remnant of stripping undergoes movement, so it is subject to the same restrictions that other movements are subject to, including the restrictions on preposition stranding. Adopting this analysis for X, the remnant of X must undergo movement as well.

The third behavior shared by X and stripping is that the voice in the first con/disjunct must match the voice in the second:

(57) a. Either Max brought the roses, or Amy ~~brought the roses~~. *X*
b. *Either Max brought the roses, or ~~the roses were brought~~ by Amy.
a. The roses were either brought by Max or ~~brought~~ by Amy.

(58) a. Max brought the roses, but not Amy. *Stripping*
b. *Max brought the roses, but not by Amy. (Merchant 2007:6)
c. The roses were brought by Max, but not by Amy. (Yoshida et al. 2015:336)

Merchant (2007, 2008, 2013) used voice (mis)match as a diagnostic for the size of the ellipsis site. If an ellipsis does not allow voice mismatch, then this ellipsis must delete at least VoiceP, which

is what he calls *clausal ellipsis*. Following Merchant's analysis, I assume that X like stripping is clausal ellipsis.[11]

Fourth, a complex NP boundary in the subject position cannot be deleted by X or stripping:[12]

(59) *X*

a. *Either the fact that the president has resigned got much publicity or ~~the fact that~~ the defense minister ~~has resigned got much publicity~~.

b. *Either the burglar who stole the car have been interrogated already or ~~the burglar who stole~~ the diamonds ~~have been interrogated already~~.

c. *Either a musician who loved Bach arrived or ~~a musician who loved~~ Mozart ~~arrived~~.

(60) *Stripping*

a. *The fact that the president has resigned got much publicity, but not the defense minister.

b. *The burglar who stole the car has been interrogated already, but not the diamonds.

c. *A musician who loved Bach arrived and Mozart too. (Based on Depiante 2000:113)

Neither stripping nor X can delete an adjunct island boundary either:[13]

(61) *X*

a. *Either although Mary will go in the morning or ~~although~~ John will go in the afternoon, Tim still refuses to go.

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[11] The only exceptions I can think of are (68a-b), where X only deletes the preposition or the determiner, and is therefore not clausal ellipsis. These examples call for a more precise definition of clausal ellipsis. If the ellipsis operates on the clausal spine, it must delete at least VoiceP. But if it only operates on a simple argument / adjunct (e.g. *at MIT*), then it is not required to delete VoiceP because there is no VoiceP to delete.

[12] Yoshida et al. (2019) found that stripping in some cases can delete an island boundary. However, all of their stimuli involve utterance-final correlates (the correlate is the phrase in the antecedent that contrasts with the remnant, such as *the president* in (59a)), which were shown by Griffiths & Liptak (2014, footnote 10) and Barros et al. (2014, section 4.5) to ameliorate the island effects. Both of these works showed that once we control for the utterance-final effect (and also the effects created by the so-called evasion strategies, as were suggested by Barros et al.), clausal ellipsis does respect island effects and cannot delete island boundaries. Therefore, I controlled for these effects by using examples that don't involve utterance-final correlates, and don't have the evasion strategies.

[13] It has also been noted in the literature (e.g. Larson 1985 and den Dikken 2006) that *either* can't be separated from the apparent DisjP by a finite clause boundary (*either* occurs in one of the bracketed positions):

(i) <??Either> he <??either> said <%either> that <either> he <either> would <either> eat <either> rice or beans.

However, an acceptability judgment survey conducted by Hofmeister (2010) indicates no significant difference between the judgment of the high positions of *either* above C and the judgment of the lower positions below C. These positions are judged to be equally good, which suggests that the restriction on the clause-boundedness of high *either* may not be correct.

Similarly, there has been disagreement in the literature on whether stripping across an embedded finite clause is possible:

(ii) Every linguist here claimed that NLLT should publish a certain kind of review on his oldest book, but not other kinds of reviews on his oldest book. (Yoshida et al. 2015:342)

Lobeck (1995:27), for example, considers it impossible to strip across an embedded finite clause, contra Depiante (2000) and Yoshida et al. (2015). For these reasons, I do not list this as a restriction on X or stripping here.

b. *Either because Mary will clean the room or ~~because~~ John will wash the dishes, the apartment will be cleaner than before.
c. *Either as long as Mary will attend the party or ~~as long as~~ John will DJ, it will be a blast.

(62) *Stripping*
a. *Although Mary will go in the morning, the event is still overcrowded, but not John.
b. *Because Mary will clean the room, the apartment will be cleaner than before, but not John.
c. *As long as Mary will DJ at the party, it will be a blast, but not John.

The properties of stripping listed above have led to Depiante's (2000) analysis: stripping involves leftward movement of the remnant followed by clausal ellipsis:[14]

(63) John relies on Mary, but not [on Susan]$_i$ ~~John relies t_i~~.

In order for ellipsis to take place, the elided phrase (E) must be parallel to the antecedent phrase (A). Depiante claims that the phrase that corresponds to the remnant in the first conjunct ("the correlate", i.e. *on Mary* in (63)) undergoes LF movement in parallel. With the movements of the correlate and the remnant, A and E are identical, and ellipsis is licensed:[15]

(64) [On Mary]$_j$ [$_A$ John relies t_j], but not [on Susan]$_i$ [$_E$ ~~John relies t_i~~].

This analysis accounts for the properties of stripping that we just saw. Because the elided phrase contains the verb that selects for the remnant, the remnant must contain the preposition (e.g. *on* in (50)) that is selected for by the verb (*relies*). Because stripping involves movement of the remnant, in languages that ban preposition stranding, the preposition cannot be stranded by the movement of the stripping remnant. Parallelism requires identity between the elided phrase and the antecedent phrase, including the Voice head. The movement of the remnant is subject to island constraints, therefore the stripping construction cannot occur across islands.

According to Depiante, the remnant has to move left because in English preposition stranding is only possible with leftward movement such as *wh*-movement and topicalization, and not with rightward movement such as heavy NP shift:

[14] This is actually not a completely faithful illustration of Depiante's analysis. Depiante assumes that *not* is constituent negation, and moves together with the PP:

(i) John relies on Mary, but [not on Susan]$_i$ ~~John relies t_i~~.

I differ from her in assuming that *not* is sentential negation and base-generated in its surface position. Because the compositional semantics of sentential negation is more straightforward than that of constituent negation (Merchant 2003).

[15] If we adopt a licensing condition of ellipsis that is based on the semantic identity of the antecedent and the elided phrase (e.g. Takahashi & Fox 2005; Hartman 2011; Messick & Thoms 2016), then technically this semantic identity should be evaluated based on the meaning of larger constituents that contain the binder for each trace:

(i) [On Mary] [$_A$ λx John relies x], but not [on Susan] [$_E$ λy John relies y].

(65) a. *I talked to t_i yesterday [the man with long hair]$_i$.
b. I talked t_i yesterday [to the man with long hair]$_i$. (Depiante 2000:108)

Because X has the same properties as stripping, I assume it is stripping, and apply Depiante's analysis of stripping to X.[16] Thus, in an *either*-seems-high sentence, the remnant moves out of the ellipsis site, and in parallel the correlate moves out of the antecedent phrase at LF. After these movements, the antecedent phrase and the elided phrase are identical, licensing deletion:

(66) John either [on Mary]$_j$ [$_A$ relies t_j] or [on Susan]$_i$ [$_E$ ~~relies t_i~~].

By arguing that the ellipsis in *either*-seems-high sentences is stripping and not gapping, not only does the current analysis capture the data, but it is also simpler than the alternative analysis by Schwarz (1999), who argues that the ellipsis is gapping. Schwarz claims, following common assumptions, that gapping must delete the finite verb. Therefore, gapping cannot apply to (67) because all that's missing is the subject in the second disjunct:

(67) Either he came or stayed home. (Schwarz 1999:365)

In order to account for (67), Schwarz proposes that the second disjunct contains a silent pronoun in the subject position that is anaphoric to the subject in the first disjunct. He further claims that English has silent subject pro, contrary to common belief, but its appearance is limited to precisely the second disjunct of a clausal disjunction.

While Schwarz's analysis can account for (67), it cannot explain other *either*-seems-high sentences that do not involve finite verb deletion. Consider (68a-b) for example, where the deleted elements are the preposition and the determiner respectively. Schwarz's analysis would have to posit two other silent elements in order to account for them, that is, a silent preposition and a silent determiner that can only appear in the second disjunct.

(68) a. I saw John either at Harvard or ~~at~~ MIT.
b. John wrote with either a pencil or ~~a~~ pen.

The current analysis can account for (67) and (68a-b) simply with stripping, and does not need to posit any silent pro, preposition or determiner.[17] In each case, the remnant moves out of the ellipsis site, and the correlate moves covertly in parallel:

(69) a. Either [came]$_i$ [$_E$ he t_i] or [stayed home]$_j$ [$_E$ ~~he t_j~~]. *Derivation for (67)*
b. I saw John either [Harvard]$_i$ [$_A$ at t_i] or [MIT]$_j$ [$_E$ ~~at t_j~~]. *Derivation for (68a)*
c. John wrote with either [pencil]$_i$ [$_A$ a t_i] or [pen]$_j$ [$_E$ ~~a t_j~~]. *Derivation for (68b)*

Because the current analysis can do without any silent pro, preposition or determiner, it is simpler than the gapping analysis.

[16] I follow Depiante's analysis, which is along the same line as Merchant's (2004). There have been different proposals about stripping in the literature (Fiengo and May 1994; Hankamer and Sag 1976; Reinhart 1991, to name a few), which Depiante discussed in detail, and compared with her proposal. See Depiante for why her proposal fares better than the alternatives, based on which I have chosen to follow Depiante.

[17] I am grateful to an NLLT reviewer for pointing this out to me.

To summarize, this section has argued that not only are *either*-seems-high sentences created by ellipsis, but this ellipsis is stripping. In the rest of this chapter I will assume that stripping creates *either*-seems-high sentences: the remnant moves out of the ellipsis site, which is then deleted by stripping.

3. Island sensitivity

Although *either*-seems-high sentences are created by ellipsis, ellipsis alone is not sufficient. This section argues for the need to posit movement of *either* by showing that the position of *either* is sensitive to islands. The ellipsis-only account cannot cover *either*-seems-low sentences because there is nothing to elide in these sentences:

(70) a. John will either eat rice or he will eat beans.
b. John either will eat rice or he will eat beans.

In light of these *either*-seems-low sentences, let us suppose that in addition to the sister of DisjP, there is another position for *either*, that is, the surface position of *either* in these *either*-seems-low sentences, as was previewed in section 1.

Are these two positions of *either* related or independent of each other? Evidence involving islands suggests that the higher position (sister of DisjP) is created by *either*'s movement from the lower position (inside DisjP).

As den Dikken (2006) has observed, *either* in *either*-seems-low sentences may not occur below a complex NP boundary, negation or a preposition. I add another observation that *either* in *either*-seems-low sentences may not occur below an adjunct clausal boundary:

(71) *Either* cannot occur below a complex NP boundary in *either*-seems-low sentences:
a. *John revised [$_{NP}$ his decision to **either** eat rice] or he revised his decision to eat beans.
b. *John revised [$_{NP}$ his decision **either** to eat rice] or he revised his decision to eat beans.
c. John **either** revised [$_{NP}$ his decision to eat rice] or he revised his decision to eat beans.
(based on den Dikken 2006:(74))

(72) *Either* cannot occur below negation in *either*-seems-low sentences:
a. *John [$_{NegP}$ didn't eat **either** rice] or he didn't eat beans.
b. John **either** [$_{NegP}$ didn't eat rice] or he didn't eat beans.
c. **Either** John [$_{NegP}$ didn't eat rice] or he didn't eat beans. (den Dikken 2006:(47))

(73) *Either* cannot occur below a preposition in *either*-seems-low sentences:
a. *John was reading [$_{PP}$ from **either** a book] or he was reading from a magazine.
b. John was reading **either** [$_{PP}$ from a book] or he was reading from a magazine.
c John was **either** reading [$_{PP}$ from a book] or he was reading from a magazine.
(den Dikken 2006:(73d))

(74) *Either* cannot occur below an adjunct clausal boundary in *either*-seems-low sentences:
a. *John went home [$_{AdjP}$ after **either** eating rice] or he went home after eating beans.
b. John **either** went home [$_{AdjP}$ after eating rice] or he went home after eating beans.

Complex NP and adjunct clauses are islands to movement. Assuming that *either* is not nominal, negation would be an island to its movement, too. I follow den Dikken (2006) in assuming that only nominals can escape from a PP, then *either*'s movement would be blocked by P as well. Therefore, in these examples, *either* must move covertly across the island boundary, creating an island violation. Specifically, *either* moves covertly to the sister position of the DisjP.[18]

Recall that *either* surfaces as the sister of DisjP in *either*-seems-high sentences. Therefore, I argue that *either* is always base-generated inside the DisjP, and then moves to Spec, DisjP. In *either*-seems-low sentences, *either* moves covertly, whereas it does so overtly in *either*-seems-high sentences.[19] I call the origination site of *either* low *either* (*either*'s surface position in *either*-seems-low sentences), and the landing site high *either* (*either*'s surface position in *either*-seems-high sentences). Then high *either* is created by movement of low *either*, and low *either* must not occur inside an island:

(75) *… either$_H$ … [$_{island}$ … either$_L$]

One may wonder if *either*'s movement violates the Coordinate Structure Constraint (CSC). I assume that CSC is a ban on movement from one of the coordinates to outside the coordinated structure (76a). Here in (76b), *either* has not moved outside DisjP, so it does not violate CSC.[20]

(76) a. *XP$_i$ ... [$_{DisjP}$ [$_A$ … t$_i$ ...] or [$_B$ …]]
b. ... [$_{DisjP}$ either$_i$ [$_{Disj'}$ [$_A$ … t$_i$ ...] or [$_B$ …]]]

Another natural question is why *either* moves. Presumably this movement is triggered by agreement with the disjunction head. In response to the probing disjunction head, *either* moves to Spec, DisjP and agrees with it. There is morphological evidence for this agreement relation. In the

[18] An NLLT reviewer asked about the acceptability of *either* below a complementizer in *either*-seems-low sentences? Here are the reported judgments:

(i) a. ?He said that he either would eat rice or that he would eat beans.
b. ??He said that he either would eat rice or claimed that he would eat beans.

These sentences do not sound so bad to my informants, which indicates that the covert movement of *either* is not clause-bound:

(iii) a. ?He said either$_i$ that he either$_i$ would eat rice or that he would eat beans.
b. ??He either$_i$ said that he either$_i$ would eat rice or claimed that he would eat beans.

[19] An NLLT reviewer pointed out another possibility, which is base-generation of *either* in Spec, DisjP, followed by lowering of *either* to somewhere inside the DisjP. This option of lowering has been suggested by Larson (1985). This lowering violates the Extension Condition (Chomsky 1993, 1995), which requires syntactic operations to extend the tree at the root. Therefore, I won't discuss lowering further in this chapter.

[20] Two NLLT reviewers have suggested two other possible ways to get around the CSC problem. First, we may posit movement of *either* to the edge of the left disjunct (A) rather than out of the disjunct. Chapter 4 discusses this possibility in more depth. Second, there are other movement types that were argued to obviate CSC violation, such as "exotic" coordination in German (Johnson 2002) and subject movement in gapping (Johnson 2009). Perhaps *either*'s movement is similar to these movements in being exempt from CSC.

negative version (*neither*…*nor*…), spreading of the negative feature to both disjunction coordinators *neither* and *nor* suggests that they do share features.[21]

Having examined the island-related facts in *either*-seems-low sentences, let us review Larson's (1985) observation about island facts in *either*-seems-high sentences. *Either* cannot be separated from the apparent DisjP by a complex NP boundary or negation, as (77) and (78) show respectively. I add my own observation that an adjunct clausal boundary cannot separate *either* from DisjP either (79).

(77) *Either* and the apparent DisjP cannot be separated by a complex NP boundary:
a. *__Either__ John revised [$_{NP}$ his decision to eat rice] or beans.
b. *John __either__ revised [$_{NP}$ his decision to eat rice] or beans.
c. *John revised __either__ [$_{NP}$ his decision to eat rice] or beans.
d. John revised [$_{NP}$ his decision to __either__ eat rice or beans].

(78) *Either* and the apparent DisjP cannot be separated by negation:
a. ??__Either__ John [$_{NegP}$ didn't try to eat rice] or beans.
b. ??John __either__ [$_{NegP}$ didn't try to eat rice] or beans.
c. John [$_{NegP}$ didn't try to __either__ eat rice or beans].

(79) *Either* and the apparent DisjP cannot be separated by an adjunct clausal boundary:
a. *__Either__ John went home [$_{AdjP}$ after eating rice] or beans.
b. *John __either__ went home [$_{AdjP}$ after eating rice] or beans.
c. John went home [$_{AdjP}$ after __either__ eating rice or beans].

These island effects in *either*-seems-high sentences can be accounted for by the ban on stripping across island boundaries, as was discussed in section 2.6.[22]

Since *either* moves, one may wonder if the movement of *either* can rule out these island facts alone, so we would not need to appeal to the restrictions on stripping. After all, low either cannot occur below an island boundary, and also high either (either in either-seems-high sentences) cannot occur above an island boundary (see the diagram in (75)). However, this cannot cover the island

[21]I remain agnostic about whether *or* itself is the disjunction head, or whether there is another covert disjunction head that agrees with both *either* and *or*. What is important is that *neither* and *nor* do share negative morphological features, which is a byproduct of their agreement with each other or their agreement with the disjunction head.

[22] To be precise, section 2.6 has only shown that stripping cannot occur across a complex NP or adjunct boundary. Whether it can occur across negation is less clear, as judgments are not categorical but only degraded. My informants said that while (i) sounds a bit awkward, (ii) is worse.

(i) ?John asked Mary to be vegetarian abruptly, not vegan.
(ii) ???John asked Mary not to be vegetarian abruptly, not vegan.

I use the adverb *abruptly* as a modifier of the event of asking to make sure that stripping applies across the embedded infinitive, including negation in (ii):

(iii) ?John asked Mary to be vegetarian abruptly, not vegan$_i$ ~~John asked Mary to be t$_i$ abruptly~~.
(iv) ???John asked Mary not to be vegetarian abruptly, not vegan$_i$ ~~John asked Mary not to be t$_i$ abruptly~~.

Notice that (78a-b) are only reported to be degraded compared to (78c). This can be understood as following from the restriction on stripping, as stripping of negation is likewise considered degraded.

facts fully. If *either* originates outside the island, then its movement should not cross any island boundary:

(80) … either$_H$ … either$_L$ [$_{island}$ …]

So far nothing prevents *either* from originating outside the island in (77)-(79), which would lead to legal movement of *either*, contrary to fact. Therefore, the island facts in *either*-seems-high sentences can only be fully accounted for by the restrictions on stripping.

Because the island facts in *either*-seems-high sentences follow from the restrictions on stripping, and the island facts in *either*-seems-low sentences follow from *either*'s movement, the island facts in these two types of sentences are not completely identical. As we have seen in (73), low *either* may not occur below P, but high *either*'s position is not sensitive to P:

(81) High *either* and the apparent DisjP can be separated by P:
a. John was **either** reading [$_{PP}$ from a book or a magazine.
b. John **either** was reading [$_{PP}$ from a book or a magazine.
c. **Either** John was reading [$_{PP}$ from a book or a magazine.

This is because stripping, the syntactic process that derives the island facts in *either*-seems high sentences, can delete a preposition:

(82) John was reading from a book, not [a magazine]$_i$ ~~John was reading from t$_i$~~.

As I have noted before, the movement of *either* does not have to cross the island boundary as long as *either* originates out of the island. (83a-c) are possible derivations for (81a-c) respectively where the movement of *either* does not cross the PP island:

(83) a. John was **either$_j$** reading t$_j$ from a book or [a magazine]$_i$ ~~reading from t$_i$~~.
b. John **either$_j$** was reading t$_j$ from a book or [a magazine]$_i$ ~~was reading from t$_i$~~.
c. *Either$_j$* John was reading t$_j$ from a book or [a magazine]$_i$ ~~he was reading from t$_i$~~.

3.1. The base-generation approach and its problems

In accounting for the distribution of *either*, den Dikken (2006) proposed that *either* is always base-generated in its surface position, and must c-command the leftmost focus. I call this the base-generation account. This subsection points out some issues of this approach as it relates to the island facts we just saw.

In order to account for the island restrictions on the distribution of high *either*, den Dikken suggested there is a restriction on where *either* can originate: it cannot be separated from the focused phrase by negation or a complex NP boundary (we can extend this to adjunct boundaries, given my observation). Den Dikken argued that the leftmost focus projects a path of θ-role assignment, and *either* must be located on this path. Negation, complex NP and adjunct clausal boundary break off this path.

According to this approach, *either*-seems-high and *either*-seems-low sentences are just a result of base-generating *either* at different locations. In *either*-seems-high sentences, *either* has been

merged higher than Spec, DisjP; in *either*-seems-low sentences, *either* has been merged inside DisjP.

While this approach can explain the island effects in *either*-seems-high sentences, it does not account for the fact that in *either*-seems-low sentences, *either* can in fact be separated from the leftmost focus by an island boundary. The following sentences show that in *either*-seems-low, *either* can be separated from the leftmost focus by a complex NP island, a PP island, an adjunct island and an inner island. Section 5.3 will discuss these facts in more detail.

(84) a. John either made [$_{island}$ the claim that he will eat rice], or he made the claim that he will eat beans.
b. John was either reading [$_{island}$ from a book] or he was reading from a magazine.
c. John is either happy [$_{island}$ because he will eat rice], or he is happy because he will eat beans.
d. John either [$_{island}$ won't eat rice] or he won't eat beans.

There is no reason why the islands break off the θ-path only in *either*-seems-high sentences, where *either* is merged above the DisjP, but not in *either*-seems-low sentences, where *either* is merged inside the DisjP.

To summarize, this section has argued that an ellipsis-only account is not sufficient, and that we need the movement of *either* to account for *either*-seems-low sentences. Specifically, *either* moves covertly in *either*-seems-low sentences, and moves overtly in *either*-seems-high sentences. The island facts in *either*-seems-low sentences follow from the fact that *either*'s movement respects islands, whereas the island facts in *either*-seems-high sentences result from the restriction that stripping cannot delete island boundaries. In addition, while a base-generation account can explain the island effects in *either*-seems-high sentences, it falls short in explaining *either*-seems-low sentences.

4. *Either* marks scope in *either*-seems-high sentences

This section shows that the two components to my proposal, ellipsis and movement together can account for some observations concerning scope. First, Larson (1985) observed that *either* marks scope in *either*-seems-high sentences. Consider (85a-b) and their respective readings.

(85) a. Sherlock pretended to **either** be looking for a burglar or a thief.
Only reading (*pretended* > DisjP > *looking for*): Sherlock pretended to do one of two things: (1) be looking for a burglar; or (2) be looking for a thief.

b. Sherlock **either** pretended to be looking for a burglar or a thief.
Only reading (DisjP > *pretended* > *looking for*): One of two things happened: (1) Sherlock pretended to be looking for a burglar; or (2) he pretended to be looking for a thief.

In the reading for (85a), the disjunction holds between two vPs, *be looking for a burglar or be looking for a thief*. For the scope taking elements that are included in this disjunction, I say they take scope below the scope of disjunction. For those that are not included in this disjunction, I say they take scope above the scope of disjunction. Therefore, we get the reading *pretended* > DisjP > *looking for* for (85a).

A simple explanation for why (85a-b) have the readings they do is based on ellipsis. As I have shown in section 2, *either*-seems-high sentences result from stripping, and the meaning of a stripping sentence is based on its underlying structure, with the deleted material recovered. Once we undo ellipsis for (85a-b), the underlying structures correspond to their readings respectively:[23]

(86) a. Sherlock pretended to either be looking for a burglar or ~~be looking for~~ a thief.
b. Sherlock either pretended to be looking for a burglar or ~~pretended to be looking for~~ a thief.

Rooth and Partee (1982) and Larson made another observation, that is *either*-seems-normal sentences are ambiguous. (87) is the *either*-seems-normal counterpart to (85a-b).

(87) Sherlock pretended to be looking for **either** a burglar or a thief. (3 readings)
✓Reading 1 (*pretended* > *looking for* > DisjP): Sherlock pretended to be looking for someone who is either a burglar or a thief.

✓Reading 2 (*pretended* > DisjP > *looking for*): Sherlock pretended to do one of two things: (1) be looking for a burglar or (2) be looking for a thief.

✓Reading 3 (DisjP > *pretended* > *looking for*): One of two things happened: (1) Sherlock pretended to be looking for a burglar or (2) he pretended to be looking for a thief.

The ambiguity of (87) follows from another part of the current analysis, that is *either* moves. Because *either*'s movement can be overt or covert, *either* in (87) is ambiguous between a high copy and a low copy. If it is a high copy, then its sister, i.e. *a burglar or a thief*, is the actual DisjP, and we get reading 1 (88a).[24] If *either* is a low copy, then there can be multiple possible positions for the high copy. If that unpronounced high copy is between *pretended* and *looking for*, we get reading 2 (88b); if it is above *pretended*, we get reading 3 (88c):

(88) a. Sherlock pretended to be looking for [$_{DisjP}$ **either$_i$** either$_i$ a burglar or a thief].
b. Sherlock pretended to be [$_{DisjP}$ either$_i$ looking for **either$_i$** a burglar or ~~looking for~~ a thief].
c. Sherlock [$_{DisjP}$ either$_i$ pretended to be looking for **either$_i$** a burglar or ~~pretended to be looking for~~ a thief].

It is worth mentioning that disjunction can take scope out of islands in *either*-seems-normal sentences, which is potentially a problem for this analysis. I will argue that it is not a problem. It suggests instead that there is another coexistent mechanism that can also derive the scope of disjunction. For the purpose of organization, I delay this discussion to the end of this section.

[23] Recall from section 2.6 that stripping involves movement of the remnant out of the ellipsis site. For the sake of convenience, I leave out the remnant movement in my illustration in some examples, and simply cross out the deleted part, but the reader should bear in mind that the remnant always moves.

[24] As an NLLT reviewer pointed out, having the quantifier *a burglar or a thief* in the object position leads to a type mismatch. One way to resolve the mismatch is to follow den Dikken et al.'s (2018) analysis of intensional predicates, and decompose *looking for* into *trying to find*. The object quantifier can then raise to a position above the covert verb *find* but below *trying to*, resolving the type mismatch and generating reading 1.

Once we consider the movement of *either*, we may return to *either*-seems-high sentences and ask why *either* in those sentences can't be a low copy, that is why it can't move covertly. For example, recall (85a), which only has the intermediate scope of disjunction. Why can't (89) be a derivation of (85a), which would incorrectly predict that it also has wide scope of disjunction?

(89) Either$_i$ Sherlock pretended to **either$_i$** be looking for a burglar or ~~he pretended to be looking for~~ a thief.

The answer is that the identity condition on ellipsis rules out this derivation. There has been a debate in the literature about whether the identity condition on ellipsis should be based on semantics or syntax. It does not matter to this chapter, and either formulation of the condition would rule out (89). For concreteness let us adopt the simple semantic condition proposed by Sag (1976) and Williams (1977), that is: the elided phrase must be semantically identical to the antecedent (see footnote 25 for why a syntactic condition on ellipsis would also rule out (89)).

As we saw in section 2, the ellipsis in the second disjunct is stripping. Following the standard analysis of stripping, the remnant *a thief* moves out of the elided phrase (E), and in parallel the correlate *a burglar* moves out of the antecedent (A) at LF. Suppose further that like all movements, *either*'s movement leaves a variable that must be bound, then following are the complete derivation for (89) and its LF:

(90) Either$_k$ [a burglar]$_j$ [$_A$ Sherlock pretended to either$_k$ be looking for t_j] or [$_{Remnant}$ a thief]$_i$ [$_E$ he pretended to be looking for t_i].
LF: Either λf a burglar λx Sherlock pretended to f be looking for x or a thief λy he pretended to be looking for y.

Now I will show that the antecedent (λx Sherlock pretended to f be looking for x) is not semantically identical to the elided phrase (λy he pretended to be looking for y). Note that the antecedent contains f but the elided phrase doesn't (this is a result of the fact that only the first disjunct contains *either*, and the noninitial disjuncts don't, which will be discussed in more detail in section 5). Semantic identity requires that for every assignment to this variable f, the antecedent phrase must be semantically identical to the elided phrase, but this cannot be satisfied no matter what the denotation of f is. I have not provided the semantics of *either* and its trace, but for concreteness, I will assume a simple meaning for them, that is they are of type <t,t> like identity functions. If the variable f is assigned an identity function, the antecedent is identical to the elided phrase. But if the variable is assigned a different meaning of type <t,t>, say negation, then the antecedent is not identical to the elided phrase. Under this assignment, the meaning of the antecedent is: λx Sherlock pretended to not be looking for x. The meaning of the elided phrase is: λy Sherlock pretended to be looking for y. They are not identical. Because we can find at least one assignment function under which the antecedent is not identical to the elided phrase, it fails to pass the semantic condition on ellipsis, and ellipsis cannot occur. Therefore, we have the generalization that ellipsis can only apply if the antecedent doesn't include the trace of *either*.[25] Following is this generalization in abstract form:

[25] The syntactic condition on ellipsis, as was proposed by Griffiths and Liptak (2014), requires that the variables in the antecedent and in the elided phrase be bound from parallel positions. If there is a variable f in the antecedent but not in elided phrase, then by definition the variable-binding relations in the antecedent do not parallel those in the elided phrase. Therefore, this condition would also force the antecedent to exclude the variable f.

(91) a. [$_{DisjP}$ [$_{Disjunct}$ either [$_{A}$ …] …] or [$_{Disjunct}$ [$_{E}$ ~~…~~] …]]
b. [$_{DisjP}$ [$_{Disjunct}$ [$_{A}$ …] either …] or [$_{Disjunct}$ [$_{E}$ ~~…~~] …]]
c. *[$_{DisjP}$ [$_{Disjunct}$ [$_{A}$ …either …] …] or [$_{Disjunct}$ [$_{E}$ ~~…~~] …]]

In order for ellipsis to apply, we must exclude *either* from the antecedent. There are two strategies to achieve this goal: (1) *either* is excluded from the antecedent to begin with; or (2) *either* is included in the antecedent but is able to escape the antecedent subsequently.

All the possible ellipsis cases we have seen so far manage to exclude *either* from the antecedent. The *either*-seems-high sentences may get their reading through the first strategy. I repeat (86a):

(92) Sherlock pretended to **either** [$_{DisjP}$ be looking for a burglar or ~~be looking for~~ a thief].

In order to delete *be looking for*, the smallest elided phrase is the VP *be looking for a thief*. Then its antecedent must be the corresponding VP in the first disjunct *be looking for a burglar*:

(93) Sherlock pretended to **either** [$_{DisjP}$ [$_{A}$ be looking for a burglar] or [$_{E}$ be looking for a thief]].

As the first step of stripping, the remnant *a thief* moves out of E. In parallel, the corresponding phrase *a burglar* moves out of A at LF. Because A and E are identical and of the form *be looking for t*, stripping can apply and delete E.

(94) Sherlock pretended to **either** [$_{DisjP}$ [a burglar]$_{j}$ [$_{A}$ be looking for t_{j}] or [$_{Remnant}$ a thief]$_{i}$ [$_{E}$ be looking for t_{i}]].

Because what we see in this sentence is high *either*, we do not know where it originates from. It may start above A (95a), demonstrating the first strategy to achieve identity between A and E. Crucially, it cannot start inside A because its presence in A would cause A to be nonidentical to E (95b).

(95) a. Sherlock pretended to **either$_{k}$** [$_{DisjP}$ either$_{k}$ [a burglar]$_{j}$ [$_{A}$ be looking for t_{j}] or [$_{Remnant}$ a thief]$_{i}$] [$_{E}$ ~~be looking for t_{i}~~].
b. *Sherlock pretended to **either$_{k}$** [$_{DisjP}$ [a burglar]$_{j}$ [$_{A}$ be either$_{k}$ looking for t_{j}] or [$_{Remnant}$ a thief]$_{i}$] [$_{E}$ ~~be looking for t_{i}~~].

Having seen the first strategy to exclude *either* from the antecedent, let us examine the second strategy, which leads to the ambiguity of *either*-seems-normal sentences. Recall that in order to get the scope above *either*'s surface position in these sentences, the *either* we see must be low *either*. I repeat (88b-c) below:

(96) a. Sherlock pretended to be either$_{i}$ [$_{DisjP}$ looking for **either$_{i}$** a burglar or ~~looking for~~ a thief].
b. Sherlock either$_{i}$ [$_{DisjP}$ pretended to be looking for **either$_{i}$** a burglar or ~~pretended to be looking for~~ a thief].

How do these sentences manage to get low *either* out of A? The answer is that *either* starts out in A, but manages to escape A later by being pied-piped by the constituent that moves out of A. (96a) illustrates what this means. In order to elide *looking for*, E has to be at least the VP *looking for a*

thief, so A is *looking for a burglar*. As we move the remnant *a thief* out of E, its correlate *a burglar* also moves out of A. Crucially, low *either*, by virtue of being the sister of *a burglar*, is pied-piped by *a burglar* and escapes A:

(97) Sherlock pretended to be [$_{DP}$ **either** a burglar]$_j$ [$_A$ looking for t$_j$] or [$_{Remnant}$ a thief]$_i$ [$_E$ looking for t$_i$].

Now that A and E are identical, ellipsis can apply:

(98) Sherlock pretended to be [$_{DP}$ **either** a burglar]$_j$ [$_A$ looking for t$_j$] or [$_{Remnant}$ a thief]$_i$ [$_E$ ~~looking for t$_i$~~].

Thus, we have seen that in addition to excluding *either* to begin with, we can base-generate *either* in A but have it subsequently escape A by being pied-piped by its sister, creating ambiguity in *either*-seems-normal sentences.

This analysis of pied-piping makes two predictions. First, the only requirement is that *either* is pied-piped by its sister. It does not require the constituent that carries *either* out of A to be a DP, as is the only case we have seen so far. *Either* should be able to be pied-piped by a VP as well. This prediction is borne out. In the following sentence, *either* is adjacent to the VP *be looking for a burglar*, and the sentence is ambiguous:

(99) Sherlock pretended to **either** be looking for a burglar or be looking for a thief.
✓ Reading 2: *pretended* > DisjP > *looking for*
✓ Reading 3: DisjP > *pretended* > *looking for*

Reading 3 is of more interest to us and corresponds to the following elided sentence:

(100) Sherlock pretended to **either** be looking for a burglar or ~~he pretended to~~ be looking for a thief.

The remnant that survives ellipsis is the VP *be looking for a thief*. To maintain identity, the corresponding VP *be looking for a burglar* has to move out as well. *Either* is adjacent to this VP, and therefore pied-piped by it and escapes A successfully:

(101) [$_A$ Sherlock pretended to t$_j$] [$_{VP}$ **either** be looking for a burglar]$_j$ or [$_E$ ~~he pretended to~~ t$_i$] [$_{Remnant}$ be looking for a thief]$_i$.

Another prediction of this analysis is that *either* does not even have to be the sister of the constituent that pied-pipes it. *Either* can be pied-piped by being embedded in this constituent as well. Again, this prediction is borne out. The following sentence has both readings 2 and 3:

(102) Sherlock pretended to **either** be looking for a burglar or to be looking for a thief.
✓ Reading 2: *pretended* > DisjP > *looking for*
✓ Reading 3: DisjP > *pretended* > *looking for*

In particular, reading 3 corresponds to coordination of two finite TPs:

(103) Sherlock pretended to **either** be looking for a burglar or ~~he pretended~~ to be looking for a thief.

In reading 3 the remnant phrase that moves out of E is the infinitival TP *to be looking for a thief*, whose correspondent in the first disjunct is *to be looking for a burglar*. *Either*, by virtue of being embedded in this infinitival TP, naturally moves out with it and escapes A. A and E are identical:

(104) [$_{TP}$ to **either** be looking for a burglar]$_j$ [$_A$ Sherlock pretended t_j] or [$_{Remnant}$ to be looking for a thief]$_i$ [$_E$ ~~he pretended~~ t_i].

As we have seen, *either*…*or*… sentences are inherently asymmetric in that only the first disjunct contains *either*. Because the elided phrase E does not contain *either*, under the identity condition on ellipsis, the antecedent phrase A must not contain it, either. Therefore, ellipsis is not possible when low *either* is trapped in A. In other words, low *either*'s position sets the upper bound of how large E can be: E cannot be so large that its corresponding A contains *either*.

I must mention that this analysis involving movement and ellipsis fails to explain an observation about *either*-seems-normal sentences–the disjunction can take scope out of islands:

(105) If John eats either shellfish or tuna, he'll have an allergic reaction, (but I can't remember which.)

The analysis proposed here cannot explain this fact. According to the analysis, high *either* marks the scope of disjunction, and is created by movement from low *either*'s position. Then this exceptionally wide scope of disjunction must be derived by covert movement of *either* out of the adjunct island and ellipsis:

(106) Either$_i$ If John eats either$_i$ shellfish or ~~if John eats~~ tuna, he'll have an allergic reaction, (but I can't remember which.)

This movement of *either* violates the adjunct island constraint, and stripping of an adjunct clause boundary is not allowed, as was shown in section 2.6.2. Therefore, the proposal so far does not explain the exceptionally wide scope of disjunction out of islands.

However, there have been other proposals in the literature that derive the exceptionally wide scope of indefinites and disjunctions through the semantics of these elements (e.g. Schlenker (2006) and Charlow (2014)). We can adopt one of these semantic analyses, which is compatible with the syntactic analysis in this chapter. Therefore, in addition to the analysis in this chapter, there is a different mechanism that can also derive the scope of disjunctions. This mechanism is responsible for the exceptionally wide scope of disjunction in *either*-seems-normal sentences. The appendix in section 7 reviews and discusses Schlenker's and Charlow's proposals. It also points out some challenges to these proposals that have not been discussed before to my knowledge. The challenges relate to an over-generation problem, that is, the mechanism to derive exceptionally wide scope is not constrained enough, and is free to apply to cases where no exceptionally wide scope is observed, such as the *either*-seems-high sentences.

One might wonder at this point whether we can do away with the current proposal completely, and derive all the empirical generalizations about *either* with the other mechanism, i.e. through the semantics of disjunctions. This is not possible because it would fail to account for the other three

empirical generalizations, namely evidence for ellipsis, the island sensitivity of *either*, and *either*-seems-low sentences. In other words, the current proposal about *either* is independently motivated by these three empirical observations.

4.1. The QR-of-DP-disjunction approach and its problem

This subsection discusses an alternative way to derive the scope of disjunction, that is (87) is ambiguous because the entire DP disjunction may be a quantifier, and can raise like other quantifiers do. Then the disjunction can QR to various positions on the clausal spine, creating different scopes of disjunction. As Rooth and Partee (1982) and Larson (1985) have noted, when the disjunction scopes high, the indefinites in each disjunct can take scope in their base position, creating "split scope readings". For example, (87) has this reading: Sherlock pretended to be looking for any burglar, or be looking for any thief. To derive this reading, we can assume that the entire disjunction QRs, but the disjuncts reconstruct to the base position.[26] I call this analysis the *QR-of-DP-disjunction approach*.

This approach parallels the analysis of the ambiguity of *only DP*. As Taglicht (1984) reported, (107a) has two readings (focus is underlined): they were advised not to learn any other language, and they were not advised to learn any other language. In contrast, (107b) only has the former reading, and (107c) only has the latter reading. The ambiguity of (107a) was argued to be a result of the quantified DP *only Spanish* raising to various positions in the clause (Rooth 1985 and Krifka 1992). The lack of ambiguity of (107b-c) was then argued to be a result of vPs not being able to take scopes like DP quantifiers.[27]

(107) a. They were advised to learn only Spanish. *advised > only*; *only > advised*
b. They were advised to only learn Spanish. *advised > only*
c. They were only advised to learn Spanish. *only > advised*

As Hendriks (2001, 2004) and Zhang (2008) have argued (which is also a part of my proposal), *either* is a focus-sensitive operator like *only*, and therefore *either DP* should be able to take scope in ways parallel to *only DP*. While this might be possible, it can't be the only way to get the scope of *either…or…*. One important difference between *either* and the other focus-sensitive operators is that *either* occurs in disjunction, which as we saw, can have ellipsis. Once elided material is recovered, we naturally get the reading associated with the underlying structure. We would thus predict *either…or…* to have more scope possibilities than *only* due to *either*'s occurrence in disjunction. This prediction is borne out. Unlike *only vP*, which has no ambiguity, *either*-seems-normal sentences with vP disjunction have ambiguity. (108) has three-way ambiguity just like an *either*-seems-normal sentence with DP disjunction (87):

[26] I am grateful to two NLLT reviewers for pointing this out to me.

[27] Hirsch (2017; 2019) proposed an alternative analysis of the scope facts in (107a-c), which parallels my analysis of *either* in that it also involves two positions of *only*.

(108) Sherlock pretended to want to either dance or sing. (3 readings)
Reading 1 (*pretended* > *want* > DisjP): Sherlock pretended to want to do an activity that is dance or sing.

Reading 2 (*pretended* > DisjP > *want*): Sherlock pretended to do one of two things: (1) want to dance or (2) want to sing.

Reading 3 (DisjP > *pretended* > *want*): One of two things happened: (1) Sherlock pretended to want to dance or (2) he pretended to want to sing.

The QR-of-DP-disjunction approach cannot explain this ambiguity because it assumes that vPs don't take scopes. In contrast, ellipsis can explain this ambiguity. For example, reading 2 can be derived from larger than surface disjunction plus ellipsis: *Sherlock pretended to want to either dance or ~~want to~~ sing*.

To summarize, the ellipsis part and the movement part of the proposal together account for most of the observations about scope in *either … or …* sentences. According to the ellipsis part of the proposal, the scope of disjunction is always the actual DisjP when elided material is recovered. Because high *either* is the sister of the actual DisjP, its location is an indicator of the scope. The movement part of the proposal claims that *either* may move covertly, and ambiguity arises when it does so. Due to the identity restriction on ellipsis, the origination site of *either* affects how much material can be elided, and hence what scope readings we can get. The origination position of *either* sets an upper bound to the size of the elided phrase. The only exception is when *either* is the sister of or embedded in the correlate, in which case there is no limit to the size of the elided phrase, and ambiguity arises.

5. *Either*-seems-low and focus sensitivity of *either*

Having discussed island and scope facts and how a combination of ellipsis and movement of *either* can explain them, this section is dedicated to *either*-seems-low sentences. In these sentences *either* appears embedded in the DisjP:

(109) a. John will **either** eat rice or he will eat beans.
b. John **either** will eat rice or he will eat beans.

To reiterate the proposal, *either*-seems-low sentences are a result of origination of *either* inside the DisjP plus covert movement of *either*. But exactly where in the DisjP does it originate, and are there restrictions on its origination site? As Hendriks (2001, 2003) has observed, *either* must always c-command the leftmost focus. This observation has been developed by den Dikken (2006), who shows that *either* can occur as the sister of the leftmost focus. I add another argument that supports this claim.

Therefore, Hendriks' and den Dikken's observations combine to indicate that *either* can occur as the sister of the leftmost focus, or in higher positions inside the DisjP that c-command the leftmost focus. A question still remains that has not been answered before to my knowledge: are these higher positions of *either* inside the DisjP base-generated or derived? I will argue that they are base-generated. In other words, *either* can originate anywhere in the DisjP as long as it c-commands the leftmost focus.

Before showing *either*'s sensitivity to focus I will first define what focus means here. As Hendriks and den Dikken have noted, it is contrastive focus. The intuition comes from the assumption that a nontautological disjunction phrase always presents disjuncts that differ from each other in some way. I assume that in each disjunct, the part that contrasts with its counterpart in the other disjuncts is contrastively focused, and those that don't contrast are not contrastively focused. For example, in (110) *rice* in the first disjunct contrasts with *beans* in the second, so they are both contrastively focused (focus is underlined):

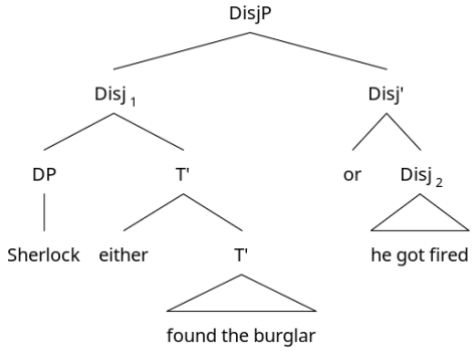
(110) John will eat <u>rice</u> from France or he will eat <u>beans</u> from France.

As Hendriks and den Dikken have observed, *either* in *either*-seems-low sentences (i.e. low *either* in my analysis) must c-command the first focus in a DisjP:[28]

(111) a. Sherlock either <u>found the burglar</u> or he <u>got fired</u>.
b. *Sherlock <u>found either the burglar</u> or he <u>got fired</u>.
c. *Sherlock <u>found the either burglar</u> or he <u>got fired</u>.
d. *Sherlock <u>found the burglar</u> either or he <u>got fired</u>.
e. *Sherlock <u>found the burglar</u> or either he <u>got fired</u>.

Hendriks and den Dikken both note that this requirement concerns the linearly first focus. Because the first focus *found the burglar* is embedded in the first disjunct, it is not hierarchically higher than the second focus *got fired*. Low *either* can only appear in the first disjunct, and therefore does not c-command the focus in the second disjunct.

(112)



This observation goes beyond sentences with exactly one focus in each disjunct to those with more than one foci in each disjunct. There, *either* still only needs to c-command the leftmost focus, which is Focus_1 below. It does not have to c-command Focus_2, Focus_3 or Focus_4. Den Dikken has already made this observation in three types of cases, to which I add another type of sentences in the following subsection.

(113) [DisjP [A … either … Focus_1 … Focus_2 …] or [$_B$ … Focus_3 … Focus_4 …]]]

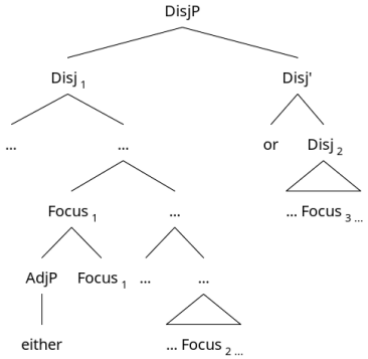
[28] Technically, in (111d) *either* could right-adjoin to the vP and still c-command the vP. I take the deviance of (111d) to indicate that *either* can only adjoin to the left edge of a constituent. I'm grateful to an NLLT reviewer for pointing this out to me.

Given Hendriks' and den Dikken's observations about *either*'s position in *either*-seems-low sentences, a question that remains open is how it gets there. Is it base-generated there, or is that position derived by movement from somewhere closer to the leftmost focus? I will show that in *either*-seems-low sentences there can be islands between *either* and Focus_1, suggesting that low *either* is not derived by movement from the sister of Focus_1, but rather base-generated:

(114) $[_{\text{DisjP}} [_{\text{A}} \ldots \text{either} \ldots [_{\text{island}} \ldots \text{Focus}_1 \ldots \text{Focus}_2 \ldots] \text{ or } [_{\text{B}} \ldots \text{Focus}_3 \ldots \text{Focus}_4 \ldots]]]$

To begin, it is important to distinguish between two possible positions for low *either*. If low *either* only needs to c-command the leftmost focus, and following Hendriks (2003:39-46) and den Dikken (2006) that *either* is a phrase, then the lowest possible position for *either* is the adjunct to the leftmost focus:

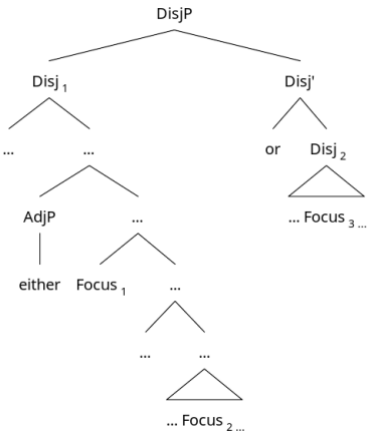
(115)



In the above structure *either* c-commands the first focus by being its sister. Crucially, it does not c-command any other focus such as Focus_2. Following Erlewine's (2017) terminology I call this a *local (adjunct) position*, and this *either local either*.

This position contrasts with other possible positions for *either*, which are structurally higher than local *either*. I call these other positions *non-local (adjunct) positions*. The following tree illustrates one such non-local position. Unlike local *either*, non-local *either* may c-command other foci besides Focus_1, such as Focus_2.

(116)



To illustrate this contrast between local *either* and non-local *either* with examples, in (117a), *either* can be the sister of the focused verb *eat*, and therefore a local *either*. In (117b) *either* is structurally higher than the first focus *rice* rather than its sister, and is therefore a non-local *either*.

(117) a. John will [$_{DisjP}$ [$_{V}$ either eat] rice or cook rice]. Local *either*
b. John will [$_{DisjP}$ either eat rice or eat beans]. Non-local *either*

In the following subsections I will show that *either* can surface as local *either*, where it only c-commands the leftmost focus and not any other focus, an indication of its sensitivity to only the leftmost focus. This generalization is interesting because the fact that *either*'s syntactic depends on linear order challenges derivational views of the grammar that have a strict ordering of grammatical operations, in which linearization strictly follows narrow syntax. The last section will discuss my speculation about why low *either* is sensitive to the linearly first focus.

5.1. Low *either*'s intervention between verb and its direct object

This subsection shows that *either* must c-command the leftmost focus with examples involving a direct object and a higher phrase. This argument is deeply inspired by den Dikken (2006), who has given three other scenarios of this kind. After presenting the argument in this subsection, I will discuss den Dikken's analysis in the next subsection.

First, the following sentences differ in whether the direct object *the planet* or the instrumental phrase *a telescope* is contrastively focused, and illustrate the point again that *either* must c-command the focus in the first disjunct:

(118) a. *John looked at either the planet with a telescope or he looked at it with binoculars.
b. John looked at either the planet with a telescope or he looked at the star with one.

Assuming that in (118a) the PP *with a telescope* attaches to and modifies the VP, and *either* attaches to the object DP *the planet*, then *either* does not c-command the focused phrase *a telescope*. In contrast, in (118b) *either* does c-command the focused phrase *the planet*.

Having seen (118a-b) which involve one focus in each disjunct, I will now present a sentence that involves two foci in each disjunct (I call this *pair focus*), and show that *either* only needs to c-command the leftmost focus. (119) differs minimally from (118a-b) in that *the planet* and *a telescope* are both focused.[29]

(119) John looked at either the planet with a telescope or the star with binoculars.

[29] Some native speakers don't accept (118a–b). They can be substituted with the following two sentences respectively and still make the same point:

(i) *John looked at either the planet with a telescope or with binoculars.
(ii) John looked at either the planet with a telescope or the star with it.

I suspect that these speakers prefer to keep *either* closer to the edge of DisjP in *either*-seems-low sentences, as they generally like *either* immediately before the verb, such as (4a,b), but not *either* immediately before the direct object. But this is only a speculation, and I leave this topic to future research.

Assuming that (119) has the same syntactic structure as (118a-b), *either* only c-commands the leftmost focus *the planet*, but not the other focus in the first disjunct *a telescope*, but this sentence is fine. This suggests that despite the presence of pair focus in the first disjunct (*the planet* and *a telescope*), *either* only c-commands the leftmost focus *the planet*. This therefore illustrates a point made earlier by the abstract structure in (114), that is no matter how many foci there are in the disjunction phrase, *either* only needs to c-command the first one. Note that *either* does not c-command the highest focus, but the leftmost one, since the PP *with a telescope* is presumably higher structurally than the direct object *the planet*.

The same point can be illustrated with examples involving a direct object and a temporal adjunct. When there is only one focus in each disjunct, *either* must c-command the focus in the first disjunct:

(120) a. *John played either checkers <u>today</u> or he played it <u>yesterday</u>.
b. John played either <u>checkers</u> today or he played <u>chess</u>.

Assuming the temporal adjunct attaches to the VP or TP, and is structurally higher than the direct object, in (120a-b) *either* only c-commands the direct object, but not the temporal adjunct. Therefore, (120a) is bad because *either* fails to c-command the focused phrase *today*, and (120b) is fine because *either* c-commands the focus *checkers*.

When there is pair focus in each disjunct, *either* only needs to c-command the leftmost one:

(121) a. John played either <u>checkers</u> <u>today</u> or he played <u>chess</u> <u>yesterday</u>.
b. *John played <u>checkers</u> either <u>today</u> or he played <u>chess</u> <u>yesterday</u>.

In (121a) *either* only c-commands *checkers*, the leftmost focus, but not *today*, linearly the second but structurally the higher focus, but the sentence is fine. In (121b) *either* c-commands *today* but not *checkers*, but the sentence is ungrammatical.

This subsection has shown that *either* must c-command the leftmost focus in the disjunction, and does not need to c-command other foci. This argument is inspired by den Dikken (2006), who has argued for the same point with evidence from three other constructions. While those observations can be found in den Dikken's paper, I consider it necessary to introduce them here, as they also serve as support for my analysis, but I will repeat only one of his arguments for the sake of space. The interested reader may refer to section 4 of his paper for the other two arguments.

5.2. Low *either*'s intervention between matrix C and the subject

In this subsection I will first introduce a generalization, that is, an adjunct may not intervene between matrix C and the subject. Then I will bring up an exception to this generalization: an adjunct may modify the subject locally, and does not count as a structural intervener. As den Dikken shows, low *either* also follows this generalization, indicating that it can be a local adjunct to focus.

First, to illustrate the generalization about all adjuncts, consider the following sentences involving the adjunct *possibly*. Depending on where the focus is (underlined), a sentence may have different readings:

(122) a. Possibly Mary left yesterday.
As an answer to the question 'When did Mary leave?'
b. Possibly Mary left yesterday.
As an answer to the question 'Who left yesterday?'

Turning (122a) into a matrix polarity question is not possible:

(123) *Did possibly Mary leave yesterday?
Intended Reading: Is it true that the day on which Mary left was possibly yesterday?

Thus, the generalization is that an adjunct may not intervene between matrix C and the subject structurally (Kayne 1984; Chapter 10 and Richards 2016):

(124) *Did [TP possibly [DP Mary] leave yesterday]?

But the following sentence is an exception to this generalization. It is the polar-question counterpart of (122b):

(125) Did possibly Mary leave yesterday?
Reading: Is it true that it was possibly Mary who left yesterday?

Then the exception to this generalization can be phrased as the following: an adjunct may not intervene between matrix C and the subject structurally, unless it is a local adjunct to the subject and forms a constituent with the subject itself:

(126) Did [DP possibly Mary] leave yesterday?

Either is subject to this generalization as well. Consider the following disjunction with contrasted temporal adjuncts:

(127) Either Mary left yesterday or today.

It is impossible to turn this disjunction into a matrix polar question:

(128) *Did either Mary leave yesterday or today?

If this polar question is ungrammatical because the adjunct *either* intervenes between matrix C and the subject, then its structure should be the following:

(129) *Did [TP either [DP Mary] leave yesterday or today]?

Now I will show that the exception to this generalization applies to *either* as well. Consider a sentence that differs minimally from (127) in that the subjects are contrasted instead of the adjuncts:

(130) Either Mary left yesterday or Sue.

Turning this sentence into a matrix polar question is possible:

(131) Did either Mary leave yesterday or Sue?

This polar question is grammatical because *either* is a local adjunct to the subject *Mary*, and does not intervene between C and the subject structurally:

(132) Did [$_{DP}$ either Mary] leave yesterday or Sue?

When both the subject and the temporal adjunct are focused (pair focus), *either* can also intervene between C and the subject:

(133) Did either Mary leave yesterday or Sue leave today?

The above sentence is grammatical because *either* modifies the subject DP, and does not intervene structurally between C and the subject:

(134) Did [$_{DP}$ either Mary] leave yesterday or Sue leave today?

In this subsection we have seen the generalization that an adjunct may not intervene between matrix C and the subject structurally, and a local adjunct to the subject is not an intervener. The fact that *either* is subject to this generalization again suggests that low *either* can be the sister of the leftmost focus, c-commanding only the leftmost focus but not the other foci.

5.3. Low *either* is created by base-generation, not movement

In *either*-seems-low sentences, (low) *either* not only can surface as a local adjunct to the leftmost focus, but it can also be far away from it, as in these two examples:

(135) a. John will either eat rice or he will eat beans.
b. John either will eat rice or he will eat beans.

How are these nonlocal positions of low *either* created? One possibility is that they are created by movement from the local adjunct position to the focus:

(136) a. John will either$_i$ eat t$_i$ rice or he will eat beans.
b. John either$_i$ will eat t$_i$ rice or he will eat beans.

The other possibility is that they are base-generated there. In other words, *either* can originate anywhere in DisjP, as long as it c-commands the leftmost focus. (137a-d) suggest that this is the correct analysis. Low *either* can be separated from the leftmost focus by a complex NP island, a PP island, an adjunct island and an inner island:

(137) a. John either made [$_{island}$ the claim that he will eat rice], or he made the claim that he will eat beans.
b. John was either reading [$_{island}$ from a book] or he was reading from a magazine.
c. John is either happy [$_{island}$ because he will eat rice], or he is happy because he will eat beans.
d. John either [$_{island}$ won't eat rice] or he won't eat beans.

Assuming that when *either* moves, it is subject to these islands, this means that *either* must not have moved across the islands, so it must be base-generated in its surface position.

5.4. The non-ATB approach and its problems

So far I have argued that low *either* is base-generated. One can imagine an alternative, that is *either* is always in Spec, DisjP. When it appears to be embedded in the DisjP, the subject, and possibly other material such as the auxiliary have non-ATB (non-across-the-board) moved out of the first disjunct, as in the following derivation. I call it the *non-ATB approach*. This subsection discusses the shortcomings of this approach.

(138) John$_i$ will$_j$ either [$_{DisjP}$ t$_i$ t$_j$ eat rice or he will eat beans].

Under this approach, the island effects that we saw with *either*-seems-low sentences in section 3 must arise because somehow negation, complex NP and adjunct clausal boundary cannot non-ATB move. This approach falls short in several ways. Most importantly, *either* isn't always in Spec, DisjP. As we have just seen in this section, *either* can be a local adjunct to the focus. Also, while the subject's non-ATB movement has been previously proposed in the literature, it is far less common to non-ATB move the auxiliary and the main verb.

To summarize, we have seen in this section evidence that supports the proposal that low *either* is base-generated anywhere in DisjP, as long as it c-commands the leftmost focus.

6. Conclusion and future questions

This chapter has argued for an analysis of *either…or…* sentences involving both ellipsis and movement of *either*. I have shown that stripping derives *either*-seems-high sentences. *Either*-seems-low sentences show that ellipsis is not enough. Once we add the movement of *either* to the analysis, the island facts and scope facts can be explained. *Either* originates inside the DisjP and moves to the edge of the DisjP. Its position is sensitive to the leftmost focus.

Sensitivity to focus is a trademark property of focus-sensitive operators. I follow Hendriks (2001, 2004), Johannessen (2005), and Zhang (2008) in arguing that *either* is a focus-sensitive operator as well.[30] An important part of my proposal is that *either* occupies two positions in a

[30] Hendriks (2001, 2004), Johannessen (2005), and Zhang (2008) have also offered many arguments that *either* is a focus-sensitive operator. One of the arguments concerns the origination site of *either*. Hendriks (2004) noted that focus-sensitive operators must attach to maximal projections. Neither can *either* nor *only* attach to non-maximal projections:

(i) a. *a small either bus or car
b. either a small bus or a small car
(ii) a. *a small only bus
b. only a small bus

sentence, and moves between them. This recalls proposals that have been made for other focus-sensitive operators (e.g. Cable's (2007) for the question-particle, Hirsch's (2017) for *only*, and Quek and Hirsch's (2017) for *even*, along with many others, e.g. Lee 2004, Barbiers 2014, Hole 2015, 2017, and Bayer 2016). In fact, these proposals have all suggested that perhaps all focus-sensitive operators share something in common: they have multiple positions in a structure that are related to each other by agreement and/or movement. If my analysis of *either* is correct, it adds another data point to this typology of focus-sensitive operators.

A question remains about why there is a need for two copies of a focus-sensitive operator, assuming that a single operator can satisfy all the roles and is simpler to learn. For instance, why must there exist a low *either*, if its sole function is to c-command the leftmost focus? It will eventually move to Spec, DisjP, a position that c-commands the focus anyway. I believe the reason is that *either* has dual functions to realize, and each position realizes one role. The low position realizes its role as a focus-sensitive operator, while the high position serves as a disjunction coordinator. This is consistent with Harris' (2018) findings based on a corpus study and an eye-tracking study.

Another curious property of low *either* is that it is only required to c-command the leftmost contrastive focus, but not the other foci. Most syntactic phenomena depend on structural height, and why is low *either* unique in tracking linear precedence? I point out two syntactic processes that are sensitive to linear order that are relevant here, and leave to future research exactly which process is the reason for *either*'s sensitivity to linear order.

The first possibility is that there is a larger class of focus-sensitive operators that are sensitive to linear order, and *either* belongs to this class. Branan & Erlewine (2020) found that in focus constructions in many languages, the leftmost phrase in focus has a privileged status: languages prefer to attach the focus-sensitive operator to the leftmost constituent in the focused phrase, or move this leftmost constituent. Branan & Erlewine provided a descriptive generalization for this fact that relies on prominence marking, and left open a deeper analysis. It is also worth noting that Branan & Erlewine argued, based on the focus particle attachment and focus movement facts, that there are two positions for a focus-sensitive operator, parallel to my analysis of *either*.

The second possibility is that *either*, which appears in disjunction, is sensitive to the leftmost focus because coordinated structures in general are sensitive to linear order. One example is the closest conjunct agreement (Koutsoudas 1968), where in languages like Welsh, among the conjuncts in a coordinated structure, it is the conjunct that is closest to the agreeing head that agrees in features with the head (Borsley 2009).

Coordinated structures are also sensitive to linear order when it comes to selection. As Sag et al. (1985) and Bruening & Al Khalaf (2020) found, category mismatches in coordination are sometimes tolerated, for example a CP can be coordinated with a DP. When such a coordination is merged with a preposition that selects for a DP but not a CP, linear order matters. The first conjunct must be a DP and not a CP. Bruening & Al Khalaf's generalization is that it is the conjunct that is closest to the selector that satisfies the selectional requirements.

(139) a. You can depend on [$_{DP}$ my assistant] and [$_{CP}$ that he will be on time].
b. *You can depend on [$_{CP}$ that my assistant will be on time] and [$_{DP}$ his intelligence].
(Sag et al. 1985:165)

Therefore, I speculate that *either*'s sensitivity to linear order is either due to its status as a focus-sensitive operator (and a class of focus-sensitive operators are sensitive to linear order), or due to

either's occurrence in coordinated structures (and coordinated structures are generally sensitive to linear order).

It's not the case that all focus-sensitive operators only need to c-command the leftmost focus. For example, English *only* is required to c-command all the foci associated with it. In the following matrix question, pre-subject *only* must be a local adjunct to the subject *Mary*, so it cannot have both foci *Mary* and *John* in its scope. Consequently, we cannot get the reading where *only* associates with both *Mary* and *John*:

(140) Did only Mary see John?
Unavailable reading: Are Mary and John the only two-person pair such that the first person in the pair saw the second person?

Suppose that in order for a focus-sensitive operator to associate with a focused element, it must always have this focused element in its scope. Also, assume that *either* in its base position interacts with focus semantically. Then this means that semantically, *either* only associates with the leftmost focus.

This result contradicts the only proposal in the literature about *either*'s association with focus that I know of (Hendriks 2003). Hendriks argues that *either* contributes exhaustivity over the possibilities mentioned in a disjunction. For instance, according to Hendriks, the meaning of the following sentence is "if John has a property of the form 'introduced x to Sue', then it is the property 'introduced Bill to Sue' or the property 'introduced Mary to Sue'".

(141) John introduced either Bill to Sue or Mary to Sue.
Semantic Interpretation: $\forall P\ [[P\{j\}\ \&\ \exists y[P = \hat{}\text{introduce'}(y,s)]] \rightarrow [P = \hat{}\text{introduce'}(b,s) \vee P = \hat{}\text{introduce'}(m,s)]]$

The presence of *either* then requires exhaustification over both foci *Bill* and *Mary*. However, for reasons discussed in section 5, *either* in this sentence c-commands the leftmost focus *Bill*, but not the other focus *Mary*. Thus, we run into a contradiction if we adopt both the assumption that *either*'s base position associates with focus, and Hendriks' proposal about *either*'s contribution to exhaustification over all foci in a DisjP.

This contradiction suggests a revision to either the assumption or Hendriks' proposal. Either *either*'s base position does not associate with focus (perhaps it is *either*'s derived position that does), or *either* only associates with the leftmost focus, and does not contribute exhaustivity over all foci. I leave this topic to future research, but suggest that it is not completely clear that *either* does introduce an exhaustive inference, given the following counterexample brought up by an NLLT reviewer:

(142) John saw either Mary or Sue, and he also saw Bill.

Hendriks would predict the continuation to contradict the preceding clause because it contradicts the exhaustive inference created by the presence of *either*, contrary to fact.

7. Appendix: Exceptionally wide scope of disjunction out of islands

This appendix discusses the fact that disjunction may take scope out of islands in *either*-seems-normal sentences, as is instantiated by the following sentence:

(143) If John eats either shellfish or tuna, he'll have an allergic reaction, (but I can't remember which.)

I will review two proposals for driving exceptional scope disjunction. They both resort to semantic tools. Both proposals are compatible with the current syntactic proposal about *either*, which has been independently motivated. I will also point out some issues with these two semantic analyses, but leave to future research how to resolve them.

The two candidate theories for the semantics of disjunction are Schlenker (2006) and Charlow (2014). Both theories were meant to account for the exceptional scope of indefinites, and were suggested to apply to disjunctions as well.

Schlenker has argued that the exceptional scope can be analyzed with choice functions. A disjunction takes as argument the set of the disjuncts. An existential quantifier can be externally merged out of the island, and binds the choice function inside the island, thus creating the exceptional scope of indefinites. (144) is the derivation for (143):

(144) ∃F [If John eats F {shellfish, tuna}, he'll have an allergic reaction.]

Under this analysis, *either*'s surface position in (143) could mark the position of the choice function, or the first disjunct that enters the set in the argument of the choice function.

Charlow (2014) has proposed a different analysis of the semantics of indefinites, which can be extended to disjunctions. According to him, indefinites (and possibly disjunctions) denote alternatives. If we allow point-wise composition, these alternatives-denoting expressions percolate their alternative-denoting property all the way up to the levels above the island, creating the effect of exceptional scope. If we only use function application as Charlow does, then the exceptional scope of alternative-generating expressions arises via "scopal pied-piping". The disjunction moves to and takes scope at the island's edge, turning the island's denotation into a set of alternatives. Then the island itself is turned into a scope-taking element, and takes scope at the matrix level. Because the island's alternatives result from the disjunction's alternatives, this creates the effect of expanding the disjunction's alternatives beyond the island.

Following is an analysis of (143) à la Charlow, where the whole sentence denotes alternatives through two movements: movement of the disjunction to the edge of the adjunct island, and movement of the island to a scope position above the conditional:

(145) [[either shellfish or tuna]$_i$ John eats t_i]$_j$ If t_j, he'll have an allergic reaction.

The first movement turns the island itself into a set of alternative propositions about different seafoods John eats: {John eats x | x ∈ {shellfish, tuna}}. Then the island is turned into a scope-taking element, which turns the entire sentence into a set of alternative propositions: {if John eats x, allergic reaction | x ∈ {shellfish, tuna}}. Under this analysis, *either*'s surface position in (143) could mark the point at which the alternative-denoting property starts to percolate.

Having introduced a natural extension of Schlenker's and Charlow's semantic analyses to disjunctions, I will now discuss a few data points that they fail to cover, which suggests future research directions.

First, neither analysis takes into account the surface position of *either*. As we saw in section 4, the scope of disjunction in *either*-seems-high sentences is fixed at the surface position of *either*, and does not take exceptionally wide scope. Take (85a) as an example, replicated below, which crucially does not have the widest scope of disjunction:[31]

(146) Sherlock pretended to either be looking for a burglar or a thief.
Only reading (*pretended* > DisjP > *looking for*): Sherlock pretended to do one of two things: (1) be looking for a burglar; or (2) be looking for a thief.
Missing reading (DisjP > *pretended* > *looking for*): One of two things happened: (1) Sherlock pretended to be looking for a burglar; or (2) he pretended to be looking for a thief.

Neither is Schlenker's nor Charlow's analysis constrained enough to prevent the disjunction in (146) from taking the widest scope. Consider Schlenker's analysis for example. Nothing prevents a choice function binder from being merged at matrix TP, creating the wide scope of disjunction:

(147) ∃F [Sherlock pretended to F { be looking for a burglar, be looking for a thief }.

This problem with *either*-seems-high sentences occurs again when the disjunction is embedded in an island. While my informants agree that disjunction can scope out of islands in *either*-seems-normal sentences, it cannot in *either*-seems-high sentences. The following sentence differs from (143) only in the surface position of *either*. Whereas in (143) *either* appears before the DP, it appears preverbally below, and the disjunction loses exceptional scope.

(148) #If John either eats shellfish or tuna, he'll have an allergic reaction, but I don't know which.

Thus, we can make the following generalization about the scope of disjunction: in *either*-seems-normal sentences, disjunction can take scope at various positions in the structure, even outside islands. In *either*-seems-high sentences, the scope of disjunction is frozen at *either*'s surface position.[32] Neither analysis along the lines of Schlenker or Charlow depends on *either*'s surface position, so they do not have an account for this.

In sum, a full account of exceptional scope of disjunction is still lacking, but the two accounts available from the literature are compatible with the syntax that this chapter has been defending.

[31] I'm grateful to an NLLT reviewer for pointing out *either*-seems-high sentences in general as an issue for Schlenker's and Charlow's analyses.

[32] I do not discuss *either*-seems-low sentences because speakers' judgments are not very clear. However, some speakers have told me that they seem to be able to find (i) grammatical:

(i) If John either eats shellfish or he eats tuna, he'll have an allergic reaction, but I don't know which.

Chapter 3[1]
Whether and *neither* are the *wh*- and negative counterparts of *either*

1. Introduction

Chapter 2 argued that *either* moves, and its landing site is the left edge of the disjunction phrase (Spec, DisjP). If there is a *wh*-counterpart of *either*, it might move from Spec, DisjP further up to Spec, CP. Because English *wh*-phrases in general can pied-pipe, we might also imagine that this *wh*-counterpart of *either* can pied-pipe its sister in its movement to Spec, CP, thus pied-piping the entire disjunction phrase (DisjP). This chapter shows that *whether* is precisely this: it moves from Spec, DisjP to Spec, CP. In this *wh*-movement, *whether* optionally pied-pipes the DisjP.

Then I will show that *neither* is the negative counterpart of *either*. Like other negative elements in English, *neither* can move to Spec, CP and trigger auxiliary inversion. Parallel to *whether*, in this negative inversion, *neither* optionally pied-pipes the DisjP. The fact that *neither* can pied-pipe the DisjP further supports the analysis in chapter 2 that the sister of *either* is the DisjP.

This chapter bases its analysis of *whether* on a puzzling contrast between *whether* and *if*. *Whether* and *if* behave differently with respect to pied-piping, which I take to suggest that *if*, unlike *whether*, is not a *wh*-element, and is therefore unable to pied-pipe the DisjP. Then I show that cross-linguistically, 'whether' in pied-piping languages behaves like English *whether*, whereas 'if' behaves like English *if*.

2. The puzzle

In this chapter, I argue that several contrasts between the behavior of *whether* and the behavior of *if* as introducers of embedded alternative questions can be explained if we assume that *whether* can pied-pipe, but there is no pied-piping in *if*-questions. Strikingly, once the pied-piping parse for *whether* is eliminated, it behaves like *if*.

This chapter argues that several contrasts between the behavior of *whether* and *if* as introducers of embedded alternative questions can be explained if we assume that *whether* can pied-pipe, but there is no pied-piping in *if*-questions. Strikingly, once we eliminate the pied-piping parse for *whether*, it behaves like *if*.

Consider first the well-known fact that *or not* can immediately follow *whether* (3), but not *if* (4) (observed by Kayne (1991), a.o.).

(1) I don't know **whether** Pat will arrive this weekend or not.
✓Yes/No (Y/N) reading: I don't know which of the following is true: (a) Pat will arrive this weekend, or (b) Pat won't arrive this weekend.

(2) I don't know **if** Pat will arrive this weekend or not. (✓Y/N)

(3) I don't know **whether** or not Pat will arrive this weekend. (✓Y/N)

(4)*I don't know **if** or not Pat will arrive this weekend. (*Y/N)

[1] This chapter has been published as Wu (2022b) in *Linguistic Inquiry*.

Whether and *if* contrast in another less well-known manner that will be significant here. Both (5) and (6) have the Alt(ernative) reading indicated below.[2] When the disjoined PP *on Saturday or on Sunday* immediately follows *whether*, this Alt reading remains (7).[3] But when the disjoined PP immediately follows *if*, the Alt reading is lost (8).

(5)I don't know **whether** Pat will arrive on Saturday or on Sunday.
✓Alt(ernative) reading: I don't know which of the following is true: (a) Pat will arrive on Saturday, or (b) Pat will arrive on Sunday.

(6)I don't know **if** Pat will arrive on Saturday or on Sunday. (✓Alt)

(7)I don't know **whether** on Saturday or on Sunday Pat will arrive. (✓Alt)

(8)I don't know **if** on Saturday or on Sunday Pat will arrive. (*Alt)

The facts in (1)–(8) can be given a unified explanation. First suppose that in (1)–(4) *or not* is a Disjunction Phrase (DisjP), disjoining the covert positive polarity (*POS*) and the negative polarity (*NEG*) *not* (9a). This DisjP supplies the polarity value to the rest of the clause. In (5)–(8), *on Saturday or on Sunday* is a DisjP coordinating two PPs (9b).

(9) a. [$_{\text{DisjP}}$ (POS) or not] b. [$_{\text{DisjP}}$ [on Saturday] or [on Sunday]]

There is a direct connection between the DisjP and the relevant reading. In the Y/N reading in (1)–(4), what is in question is the choice between the two alternatives *Pat will arrive this weekend* and *Pat won't arrive this weekend*. These alternatives differ only in their polarity value. Notice that the DisjP *or not* provides the polarity values they differ in. Therefore, I say the alternatives presented in the DisjP *(POS) or not* are *put under question* in the Y/N reading. As I will show in section 3.3, when the sentence does not contain *or not*, there is another way to generate the Y/N reading. For the moment, I set it aside and focus on sentences containing *or not*.

Likewise, in the Alt reading in (5)–(8), what is put under question is the choice between the two alternatives *Pat will arrive on Saturday* and *Pat will arrive on Sunday*. These alternatives differ only in their PP, which is supplied by the temporal DisjP *on Saturday or on Sunday*. Therefore, I say that in this reading, it is the alternatives presented in the DisjP *on Saturday or on Sunday* that are *put under question*.

The puzzle can then be described as a correlation between the position of the DisjP and the relevant readings. This unified puzzle can be summarized as follows:

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[2] Examples (5) and (6) permit a Y/N reading, but that is not relevant to the current discussion. Section 2.3 will briefly discuss this Y/N reading of (5) and (6).

[3] Of the 8 native speakers I interviewed, 6 shared this judgment and agreed that (8) is worse than (7); the other 2 found (7) so awkward that "it just sounds bad," and reported (8) to be ungrammatical as well. Crucially, no one who accepted (7) also accepted (8). As I will argue later, the contrast between (3) and (4) and the contrast between (7) and (8) follow from *whether*'s ability to pied-pipe its sister. For those who rejected (7) and (8) yet agreed with the contrast between (3) and (4), *whether* can pied-pipe certain elements (e.g., the polar DisjP *or not*) but not others (e.g., the temporal DisjP *on Saturday or on Sunday*). This is not surprising, as *wh*-phrases cannot pied-pipe every type of element in English anyway. For example, a *wh*-object can pied-pipe a preposition but not a verb.

Furthermore, there is already dialectal variation in what material can be pied-piped by other *wh*-phrases. For example, the structure in (i), also known as "massive pied-piping" in relative clauses, was reported to be ungrammatical by Heck (2009:78), but judged to be fine by Ross (1986:121):

(i) *a man [$_{\text{DP}}$ a deck chair of whom]$_1$ you spilled coffee on t_1

(10) Unified puzzle
a. The alternatives presented in a DisjP can be put under question when that DisjP immediately follows *whether*.
b. The alternatives presented in a DisjP cannot be put under question when that DisjP immediately follows *if*.

3. The solution

First, I assume the following structure for *whether*- and *if*-questions, following the analysis in chapter 2. In a *whether*-question, *whether*, the *wh*-counterpart of *either*, originates inside the first disjunct, and moves to be the sister of the DisjP to form Spec, DisjP. After that, *whether* as a *wh*-phrase subsequently moves to Spec, CP.

(11) a. I don't know [$_{CP}$ whether$_i$ [$_{C'}$ C^0 [$_{TP}$ Pat will arrive this weekend [$_{DisjP}$ t$_i$ [$_{Disj'}$ (POS) or not]]]]].
b. I don't know [$_{CP}$ whether$_i$ [$_{C'}$ C^0 [$_{TP}$ [$_{T'}$ Pat will arrive] [$_{DisjP}$ t$_i$ [$_{Disj'}$ on Saturday or on Sunday]]]]].

In an *if*-question, there is a covert counterpart of *whether* with the same derivational history – that is, it originates in Spec, DisjP and moves from Spec, DisjP to Spec, CP. In addition, *if* is C^0. Let us refer to this covert counterpart of *whether* as *Op(erator)*.

(12) a. I don't know [$_{CP}$ Op$_i$ [$_{C'}$ if [$_{TP}$ Pat will arrive this weekend [$_{DisjP}$ t$_i$ [$_{Disj'}$ (POS) or not]]]]].

b. I don't know [$_{CP}$ Op$_i$ [$_{C'}$ if [$_{TP}$ Pat will arrive [$_{DisjP}$ t$_i$ [$_{Disj'}$ on Saturday or on Sunday]].

This structure can derive the meaning with existing theories of question semantics. For example, assume that the DisjP denotes a choice-functional trace applying to a set, and the landing site of *whether*/Op existentially quantifies over this trace: 'I don't know [λp: ∃f. p=Pat will arrive f({on Saturday, on Sunday})]' for (12b). The question operator can be an identity function in the sense of Hamblin (1973) and Karttunen (1977).

The reading where the alternatives presented in a DisjP are put under question arises in the following way: (a) merge *whether* / Op as the sister of the DisjP; and (b) move *whether* / Op to Spec, CP. If either step fails to take place, the alternatives in the DisjP cannot be put under question and the relevant reading will be lost.

3.1. Why DisjP cannot be put under question when immediately following *if*

The alternatives in the DisjP that immediately follows *if* cannot be put under question because Op fails to move to Spec, CP from the position it would have to move from.

When the DisjP follows *if*, I assume that the DisjP occupies a derived Ā-position as a result of what I will assume to be topicalization:[4]

[4] While the disjoined PP can be topicalized (13b), it may be difficult to imagine topicalizing a polar disjunction (13a), which may be the reason why (13a) is judged ungrammatical. In any case, this point of view does not conflict with the goal of this section, which is to rule out (13a–b).

(13) a. *Derivation for (4)*
*I don't know [$_{CP}$ Op$_i$ if [$_{TopP}$ [$_{DisjP}$ t$_i$ [$_{Disj'}$ (POS) or not]]$_j$ Top^0 [$_{TP}$ Pat will arrive this weekend t$_j$]]].
b. *Derivation for (8)*
*I don't know [$_{CP}$ Op$_i$ if [$_{TopP}$ [$_{DisjP}$ t$_i$ [$_{Disj'}$ on Saturday or on Sunday]]$_j$ Top^0 [$_{TP}$ Pat will arrive t$_j$]]].

The structures in (13) are excluded because a topicalized phrase may not contain a *wh*-trace:

(14) *[$_{CP}$ wh$_i$ C^0 [$_{TopP}$ [… t$_i$ …]$_j$ Top^0… t$_j$]]]

The examples in (15) show that this ban is true for English in general.[5]

(15) a. *I wonder whom$_j$ [to t$_j$]$_i$ you talked t$_i$.
b. *I wonder [what day]$_j$ Pat thinks that [on t$_j$]$_i$ you left t$_i$.
c. *I wonder [whose book]$_j$ Kim claims that [about t$_j$]$_i$ you talked t$_i$.

This restriction may form a part of a broader generalization that bans an Ā-moved element that contains another Ā-trace (Lasnik and Saito 1992, Takahashi 1994, Müller 1998 & 2010, Corver 2014, Bošković 2018, a.o.), but for the purposes of this chapter, the restriction alone suffices. Because the topicalized DisjP cannot contain the *wh*-trace of Op in (13a–b), the alternatives in the DisjP cannot be put under question.

3.2. Why DisjP can be put under question when immediately following *whether*

We may wonder why the alternatives in the DisjP that immediately follows *whether* can be put under question, as the same empirical generalization that rules out extraction of Op from the topicalized DisjP should rule out extraction of *whether* from the topicalized DisjP as well.

I argue that this is because *whether*, being a *wh*-phrase, can pied-pipe. Consequently, there is another way to parse (3) and (7), where the DisjP following *whether* is pied-piped by *whether* rather than topicalized:

(16) a. *Derivation for (3)*
I don't know [$_{CP}$ [$_{DisjP}$ whether [$_{Disj'}$ (POS) or not]]$_i$ C^0 [$_{TP}$ Pat will arrive this weekend t$_i$]].

b. *Derivation for (7)*
I don't know [$_{CP}$ [$_{DisjP}$ whether [$_{Disj'}$ on Saturday or on Sunday]]$_i$ C^0 [$_{TP}$ Pat will arrive t$_i$.]]

Recall that in order to put the alternatives in the DisjP under question, all we need is to move *whether* to Spec, CP. We do not care if *whether* pied-pipes other material. (16) satisfies this requirement because the final position for *whether* is in Spec, CP. Thus, the alternatives in the DisjP that is pied-piped by *whether* can be put under question.

[5] Lasnik and Saito (1992) claimed that a topicalized DP containing a type-e trace is not completely unacceptable. This does not weaken the claim made here because the topicalized DisjP examined in this squib is not nominal. In addition, *whether* and Op are likely not type e.

Two pieces of evidence support the claim that *whether* can pied-pipe the DisjP. The first comes from sluicing. Assuming that sluicing deletes TP or C', the only element that can survive sluicing is Spec, CP. Material pied-piped by the *wh*-phrase survives sluicing, as in (17).

(17) a. Pat talked to someone, but I don't know to whom ~~Pat talked~~.
b. Pat left on some day, but I don't know on which day ~~Pat left~~.

Strikingly, *whether* plus a DisjP may remain after sluicing, indicating that the DisjP must have been pied-piped by *whether*.[6]

(18) I know that Pat will arrive sometime on the weekend. I'm just not sure whether on Saturday or on Sunday.

The second piece of evidence for *whether*'s ability to pied-pipe comes from variants of English that allow overt *whether* and auxiliary inversion to cooccur – in other words, variants where, in a matrix clause, *whether* may appear to the left of the auxiliary in C^0 (e.g., *Whether will Pat arrive?*). Assuming that the constituent immediately to the left of C^0 occupies Spec, CP, then if *whether* and the DisjP can appear together before C^0, this can be taken as evidence that *whether* and the DisjP are one constituent, and *whether* pied-pipes the DisjP.

Such sentences are attested in legal documents from the 19th ((19)–(20)) and 20th (21) centuries. Even more strikingly, *whether* and the pied-piped DisjP together can be coordinated with other *wh*-elements that occupy Spec, CP, including material pied-piped by other *wh*-phrases like *for what purpose* and *by whom* (19b). The coordination fact again suggests that DisjP, like other pied-piped material, occupies Spec, CP.

(19) a. Whether or not did you prepare a lease, pursuant and conformable to such instructions?
b. And if yea, for what purpose, and when and by whom and whether or not was such counterpart, left with the said complainant?[7]

(20) a. Whether or not did such action come on to be tried?
b. Whether or not were the judge desirous to find a special verdict; …[8]
(21) I will ask you whether or not did the defendant make any voluntary statement to you after he was placed under arrest?[9]

Also, suppose that *whether* is a *wh*-word, as it shares *wh*- morphology with other *wh*-words (e.g. Emonds 1976). Since *wh*-words can pied-pipe in general in English, *whether* – being a *wh*-word – should also be able to pied-pipe.

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[6] All 6 speakers I consulted accepted (18), which is striking because *whether* on its own resists sluicing.

(i) *I know that Pat will arrive on either Saturday or Sunday, I just don't know whether.

The acceptability of (18) suggests that *whether*-sluicing is actually possible, but only when *whether* pied-pipes. I leave it to future research why this is the case.

[7] (19a&b) come from https://books.google.com/books?id=v2VjAAAAcAAJ.

[8] (20a&b) come from https://books.google.com/books?id=-rQDAAAAQAAJ.

[9] https://law.justia.com/cases/texas/court-of-criminal-appeals/1962/34019-3.html.

If (3) and (7) have the relevant readings because the DisjP is pied-piped by *whether* rather than topicalized, then this analysis makes a prediction. If we prevent the structure from being parsed as involving pied-piping, then *whether*-sentences without pied-piping should behave like *if*-sentences, and the relevant reading should disappear.

One way to rule out the pied-piping parse is by interpolating an adverb or a parenthetical between *whether* and DisjP, adapting a test first developed by Rudin (1988) for Bulgarian. For instance, regular *wh*-sentences with pied-piping become ungrammatical once the *wh*-word and the pied-piped material are separated by interpolation:

(22) *I wonder to, {according to Kim/actually/fortunately}, whom you talked.

Interpolation between *whether* and the DisjP makes the *whether*-sentences *if*-like, as the relevant readings are no longer available.

(23) *I don't know whether, {according to Kim/actually/fortunately}, or not Pat will arrive this weekend.
(24) I don't know whether, {according to Kim/actually/fortunately}, on Saturday or on Sunday Pat will arrive. (*Alt)

The interpolation test shows that pied-piping is the reason why the alternatives in the DisjP that follows *whether* can be put under question. Once we rule out the pied-piping parse by interpolation, the relevant readings also disappear.

If *whether*-sentences allow the relevant readings because of a parse in which *whether* pied-pipes DisjP, we may wonder whether Op can pied-pipe DisjP as well.

Even if it can, the *if*-sentences (13a–b) that were under analysis in section 3.1 cannot be analyzed as cases of Op pied-piping because of the incorrect word order. If Op can pied-pipe DisjP, the word order in (25) should be possible, but it is also ungrammatical.

(25) a. *I don't know $[_{DisjP}$ Op $[_{Disj'}$ (POS) or not$]]_i$ if Pat will arrive this weekend t_i.
b. *I don't know $[_{DisjP}$ Op $[_{Disj'}$ on Saturday or on Sunday$]]_i$ if Pat will arrive t_i.

There are two possible reasons why (25a–b) are bad. First, they violate the Doubly Filled Comp Filter, which prohibits overt occurrence of both the head (*if*) and its specifier (DisjP). Second, it is possible that phonologically null elements cannot pied-pipe overt material, so Op cannot pied-pipe the DisjP, unlike *whether*. I do not commit to a particular reason here, noting only that (25a–b) can be ruled out by one of them.

Because the pied-piping parse is unavailable for *if*-sentences, the *if*-counterpart of (18) is predicted to be ungrammatical, which is the case.

(26) *I know that Pat will arrive sometime on the weekend. I'm just not sure if on Saturday or on Sunday.

3.3. An additional reading of (5)–(8)

In addition to the Alt reading, (5)–(8) also have a Y/N reading, that is, 'I don't know which of the following is true: (a) Pat will arrive on a weekend day (either Saturday or Sunday), or (b) Pat won't arrive on either of those days'.

So far, the discussion has only concerned the presence or absence of Alt reading of (5)–(8). Why is the Y/N reading always available for them?

One possible assumption, following Hamblin (1973), Karttunen (1977) and Biezma (2009), is that there are two types of questions, with different question operators: Q_{Alt} and $Q_{yes/no}$.[10] Q_{Alt} is an identity function that scopes over the set denoted by an overt disjunction: $[\![Q_{Alt}]\!] = \lambda p.\ \lambda q.p = q$.[11] It is present in (1)–(4), and in the Alt-reading parse of (5)–(8).

$Q_{yes/no}$ takes a simple proposition and induces a partition of the set of possible worlds into disjunctive polar sets: $[\![Q_{yes/no}]\!] = \lambda p.\ \lambda q.[q = p \vee q = \neg p]$. The additional Y/N reading in (5)–(8) results from the presence of $Q_{yes/no}$, which simply converts any proposition into a Y/N question. (7)–(8) involves topicalization of the temporal DisjP inside this simple proposition, which should not affect its semantic composition with $Q_{yes/no}$ and thus does not affect the Y/N reading.

4. Crosslinguistic Analyses: Polish and Bengali

In this section, I show that Polish has 'whether' but not 'if', and Bengali has 'if' but not 'whether', so together they complete the paradigm found in English. In addition, they offer something that English *whether* does not have: they have multiple lexical items for 'or'. In particular, Polish 'or' is identical in form to the initial coordinator ('either', 'whether', 'neither') it is local to. Taking this morphological identity to indicate an agreement relation between them, I offer an analysis of how pied-piping occurs in Polish, which in turn can be applied to English as well.

4.1. Polish Has 'Whether'

Example (27) shows the neutral word order for an embedded alternative question in Polish.[12] I will argue that the first *czy* should be analyzed as 'whether'. Note that it is identical in form to the disjunction coordinator, glossed as 'or1' (in contrast to 'or2', to be discussed in section 4.3). In section 4.3, I will discuss why (27) lacks the Y/N reading.

(27) Nie wiem czy Jan przyjedzie w sobotę czy w niedzielę.
not know.1SG whether Jan arrive.PERF.3SG in Saturday or1 in Sunday
Literal meaning: 'I don't know whether Jan will arrive on Saturday or on Sunday.'
✓Alt reading: I don't know which of the following is true: (a) Jan will arrive on Saturday, or (b) Jan will arrive on Sunday.
*Y/N reading: Which of the following is true: (a) Jan will arrive on a weekend day, or (b) Jan won't arrive on a weekend day?

[10] Another possibility in parallel, following Larson (1985), is that *or not* is optionally pronounced. Both this possibility and the one discussed in the main text can be true at the same time. When *or not* is present but not pronounced, the sentence combines with Q_{Alt}. When *or not* is not present at all, the sentence combines with $Q_{yes/no}$.

[11] For clarity, I have not included the complete details of the denotations.

[12] I am grateful to Barbara Citko, Barbara Tomaszewicz, and Bartosz Wiland for the Polish judgments in this section.

In parallel to (7), when the temporal DisjP immediately follows *czy* 'whether', the Alt reading remains.

(28) Nie wiem czy w sobotę czy w niedzielę Jan przyjedzie.
not know.1sg whether in Saturday or1 in Sunday Jan arrive.PERF.3SG
Literal meaning: 'I don't know whether on Saturday or on Sunday Jan will arrive.'
(✓Alt)

If *czy* is analyzed as the Polish counterpart to *whether*, and if *czy* can pied-pipe the DisjP, (28) is explained: *czy* pied-pipes the DisjP, generating the Alt reading.

The argument from sluicing in English applies to Polish, as *czy w sobotę czy w niedzielę* 'whether on Saturday or on Sunday' can survive sluicing. Furthermore, Wiland (2017) observes that *czy* 'whether' has *wh*-morphology. Since Polish *wh*-phrases can pied-pipe in general, *czy* should also be able to pied-pipe.

4.2. Bengali Does Not Have 'Whether'

Example (29) shows the neutral word order for a matrix alternative question in Bengali.[13] Notice that it has only the Alt reading, and *na* is glossed as 'or1' (parallel to Polish (28)). See footnote 17 for an analysis of Bengali's two 'or's and why (29) lacks the Y/N reading.

(29) rubai ki sonibar na robibar rôwna hoeche?
Rubai PRT Saturday or1 Sunday depart happen.PRES
Literal meaning: 'Did Rubai depart on Saturday or on Sunday?'
✓Alt reading: Which of the following is true: (a) Rubai left on Saturday, or (b) Rubai left on Sunday?
*Y/N reading: Which of the following is true: (a) Rubai left on a weekend day, or (b) Rubai didn't leave on a weekend day?

When the temporal DisjP precedes *ki*, the sentence becomes ungrammatical:

(30) *sonibar na robibar ki rubai rôwna hoeche?
Saturday or1 Sunday PRT Rubai depart happen.PRES

Ki behaves almost exactly like what Bhatt and Dayal (2020) call "polar *kya:*" in Hindi-Urdu. Following Bhatt and Dayal, I analyze *ki* as a particle in ForceP and consider the DisjP to have moved (scrambled, to be precise) in front of *ki* in (30).[14] In addition, following Larson's (1985)

[13] I am grateful to Neil Banerjee for providing Bengali judgments in this section.

[14] Tests based on idiomatic objects and continuation show that elements in front of *ki* get there through movement, specifically topicalization. These tests are adapted from Bhatt and Dayal (2019).

First, Bengali allows many different elements to appear before *ki*, but not idiomatic objects. In (i) 'give gas' is an idiom, and *ki* can follow many elements, but not 'gas'. This suggests that the movement to precede *ki* is topicalization because idiomatic objects resist topicalization.

(i) rubai <ki> munai-ke <ki> gas <*ki> diy-e <ki> porishkar kôr-a-l-o
Rubai Q Munai-OBL Q gas Q give.PRFT Q clean do-CAUS-PST-3RD
'Did Rubai get Munai to clean by stoking her ego?'

analysis for English, I assume that Bengali has a null question operator equivalent to English Op (originating as the sister of DisjP and moving to Spec, CP). Crucially, as a null element, it cannot pied-pipe the DisjP, which is overt. Then the movement of the DisjP traps this null operator and causes ungrammaticality.[15]

4.3. Two 'or's in Polish, Bengali, and English

Polish and Bengali have two 'or's, which prompted the gloss 'or1' on *czy* in (27) and *na* in (29). As I will show, English has two 'or's as well. My analysis of the multiple 'or's provides an account of how pied-piping occurs in English and Polish.

Recall the absence of Y/N reading for the Polish example (27). For this reading to surface, the disjunction coordinator in (27) must be replaced by *albo*, glossed as 'or2' in (31).

(31) Nie wiem czy Jan przyjedzie w sobotę **albo** w niedzielę.
Not know.1sg whether Jan arrive.PERF.3SG in Saturday or2 in Sunday
(*Alt; ✓Y/N)

When 'or1' surfaces, we can only get the Alt reading (27); when 'or2' surfaces, we can only get the Y/N reading (31). I argue that the reason for the complementary distribution of the two 'or's is that their presence indicates different syntactic structures.

Note the identical form of *czy* 'whether' and *czy* 'or'. Notice also that the Polish word for 'either' (the [-wh] counterpart to 'whether') is identical in form to *albo* 'or2' ('neither' and 'nor' are identical too, see footnote 18):[16]

(32) **Albo** Jan przyjedzie w sobotę **albo** przyjedzie w niedzielę.
Either Jan will.arrive on Saturday or2 will.arrive on Sunday
'Either Jan will arrive on Saturday or he will arrive on Sunday.'

Second, the element preceding *ki* is presupposed, which also suggests its status as a topic. (ii) shows that elements following *ki* are not presupposed and open for confirmation in continuation, in contrast to elements preceding *ki*.

(ii) Rubai ki Munai-ke boi-ṭa di-l-o...
Rubai Q Munai-OBL book-CL give-PST-3RD
'Did Rubai give the book to Munai…'

a. #na Rati
or2 Rati
'or Rati did?'

b. na Rati-ke
or2 Rati-OBL
'or to Rati?'

c. na magazine-ṭa
or2 magazine-CL
'or the magazine?'

d. na na
or2 not
'or not?'

[15] Bhatt and Dayal (2017) observed patterns nearly identical to Bengali for Hindi-Urdu, a major difference being that Hindi-Urdu only has one 'or'. My analysis also applies to Hindi-Urdu, whose null question operator cannot pied-pipe.

[16] Example (30) is a counterexample to an alternative analysis that claims that *czy* 'or1' only coordinates clauses, and *albo* 'or2' only coordinates phrases that are smaller than clauses. Likewise, Bengali *ba* 'or2' can also coordinate clauses, again suggesting that this alternative analysis is incorrect for Bengali as well:

(i) rubai sonibare rôwna hoeche, **ba** raj robibare poucheche
Rubai on.Saturday depart happen.PRES, or2 Raj on.Sunday arrive.PRF.AUX
'Rubai left on Saturday, or Raj arrived on Sunday.'

I propose that the appearance of the coordinator 'or' depends on the initial coordinator it has been local to. 'Or' appears as *czy* 'or1' if and only if it has been local to *czy* 'whether', and as albo 'or2' if and only if it has been local to *albo* 'either'. This means that in (27), *czy* 'whether' must have been the sister of the temporal DisjP formed by *czy* 'or1', so it has the Alt reading.[17,18] (31) lacks the Alt reading because 'whether' cannot have originated as the sister of the temporal DisjP.

Furthermore, I propose that the morphological identity between 'whether' and 'or' is the reflex of an agreement relation between them. When 'whether' originates as the sister of a DisjP, it agrees with 'or' and copies its morphological feature to 'or' under agreement.

In the same way that 'whether' agrees with 'or', 'either' agrees with the 'or' it is local to and copies its morphological features to 'or' under agreement. The surface form of 'or' can thus be taken to indicate the original site of 'either'/'whether'. 'Or' surfaces as *czy* under locality to 'whether', and as *albo* under locality to 'either'.

This sharing of morphological features exists in English as well. There are two morphologically related 'or's in English: 'or' surfaces as *nor* when it has been local to *neither*; 'or' surfaces as *or* when it has not been local to *neither*. *Neither* has been analyzed as the negative counterpart of *either* (e.g., Hendriks 2004, den Dikken 2006). Den Dikken argues that similar to *whether*, *neither* has been the sister of a DisjP and may move up later, triggering auxiliary inversion. Then the negative morphology on *nor* can be taken as a reflex of agreement between *neither* and *nor* when *neither* is local to *nor*.

If we generalize beyond *neither* and claim that English *whether* also agrees with *or* (despite no overt shared morphology), we can explain how pied-piping occurs in English and Polish. As I have argued, 'whether'/'neither'/'either' agrees with 'or'. For example, when Polish *czy* 'whether' agrees with 'or', it spreads its *wh*-feature to 'or', which then projects the *wh*-feature to the entire DisjP. As the interrogative C probes for the *wh*-feature, the entire DisjP and its specifier 'whether' are both eligible goals and equidistant to the C probe because of the *wh*-feature on them (Pesetsky and Torrego 2001). If C agrees with the DisjP, the entire DisjP moves to Spec, CP, creating pied-piping effects. If C agrees with 'whether' alone, 'whether' moves by itself.

By pooling 'neither' and 'whether', this analysis makes a prediction: *neither* should also be able to pied-pipe. As the entire DisjP inherits the negative feature through agreement between

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[17] The same analysis applies to Bengali. Recall the absence of the Y/N reading in (29). To get the Y/N reading, *na* 'or1' must be replaced by *ba* 'or2':

(i) rubai ki sonibar **ba** robibar rôwna hoeche?
Rubai PRT Saturday or2 Sunday depart happen.PRES (✓Y/N;*Alt)

'Or' takes the form of *na* 'or1' if and only if it has been local to the null question operator, otherwise it appears as *ba*.

In parallel to (8), scrambling of the temporal DisjP coordinated by *ba* 'or2' in (i) does not affect the Y/N reading because scrambling within the simple proposition that composes with $Q_{yes/no}$ does not affect the composed meaning:

(ii) sonibar **ba** robibar ki rubai rôwna hoeche?
Saturday or2 Sunday PRT Rubai depart happen.PRES (✓Y/N)

[18] As a Linguistic Inquiry reviewer suggested, the reason why (27) lacks the Y/N reading may be that the structure involving *whether*'s movement is the wrong type to combine with $Q_{yes/no}$. In support of this idea, *czy* 'or1' is limited to questions. For example, *czy* 'or1' may not be used in 'neither … nor …' constructions, which use the form of *ani ... ani ...* instead. The same applies to Bengali, whose *na* 'or1' is limited to questions and cannot be used in 'neither … nor …'.

neither and *nor*, the entire DisjP and *neither* are equidistant to the probe for the negative feature. This prediction is borne out.

(33) There will be terrible weather all this weekend, therefore…
  a. *No pied-piping*
    … [neither]$_i$ will Pat arrive t_i on Saturday nor on Sunday.
  b. *Pied-piping*
    … [neither on Saturday nor on Sunday]$_i$ will Pat arrive t_i.

In (33b), *neither* and the DisjP appear to the left of C^0, an indication that they occupy Spec, CP, and the DisjP is pied-piped by *neither*.

5. Conclusion

In addition to the observation that polar DisjP cannot immediately follow *if*, this chapter has made the novel observation that temporal DisjP cannot immediately follow *if* either to derive the relevant Alt reading. This puzzle can be subsumed under the generalization that topicalized phrases may not contain a *wh*-trace. *Whether*-questions are different because they have another parse in which *whether* pied-pipes the DisjP, putting its alternatives under question. Then I showed that Polish has 'whether', which has the ability to pied-pipe, whereas Bengali does not, and that English *neither* can pied-pipe as well.[19]

The fact that *whether* and *neither* can pied-pipe the DisjP suggests that they have been the sister of the DisjP, supporting the analysis in chapter 2 that *either* is the sister of the DisjP.

[19] Guerzoni and Sharvit (2014) observe that the negative polarity item (NPI) *ever* is acceptable when following *whether or not*, but not when appearing between *whether* and *or not*.

(i) a. *Mary wondered whether her student had ever read *Syntactic Structures* or not.
  b. Mary wondered whether or not her student had ever read *Syntactic Structures*.
(Guerzoni and Sharvit 2004:202)

According to the proposal in this squib, *or not* is stranded in its base position in (ia) and pied-piped in (ib). Assume also that *or not* disjoins the positive and negative polarities and is base-generated somewhere between v and T. Suppose that an NPI is licensed when c-commanded by a negative element, and that *or not* is such a negative element by inheriting the negative feature of its disjunct. Then the ungrammaticality of (ia) is puzzling because *or not* in its base position should c-command and thus license the NPI. This issue can be resolved if we adopt Ladusaw's (1980) Left-Right Order Restriction on NPI-licensing: that is, an NPI must be preceded by its licensor. In (ia), the NPI precedes negation.

Chapter 4
Syntax of negation in corrective *but* sentences

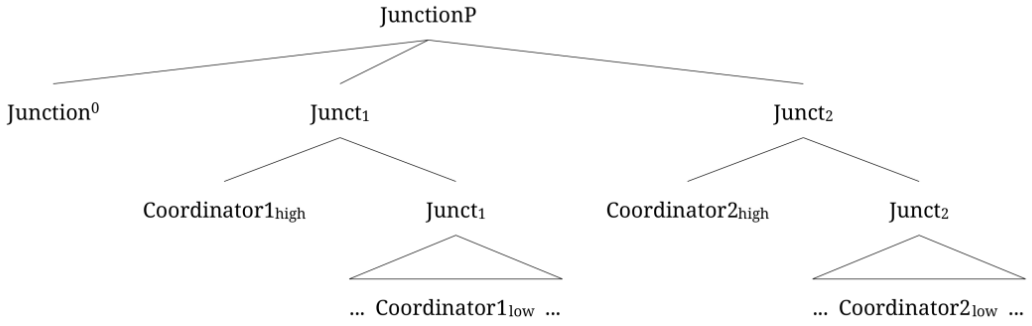
1. Introduction

Chapter 2 argued that *either* has two positions in *either…or…*, and that ellipsis can occur to obscure the position of *either*. This chapter shows with independent evidence that corrective *but* sentences (following Toosarvandani's 2013, 2014 terminology), a construction that is apparently not related to *either…or…*, nevertheless have a very similar analysis. This analysis has the following consequences: there is a use of negation that must be adjacent to conjunction. In this use, negation is also a focus-sensitive operator. My analysis of negation in corrective *but* contributes to the generalization that all focus-sensitive operators have two positions in a sentence.

The nearly identical analysis of corrective *but* sentences and *either…or…* suggests that perhaps all coordination has the same syntactic structure and all coordinators have the same syntax. I use *Junction Phrase (JunctionP)* as a general term for conjunction or disjunction, and *junct* as a general term for conjunct or disjunct (e.g., in the disjunction *either A or B*, A and B are the disjuncts).

This chapter argues for the following generalized structure of coordination (1): several juncts are coordinated, and each junct has a coordinator (e.g., *either* and *or*) has its daughter. The coordinators have a lower position that is deeply embedded in the respective junct. These juncts then merge with a covert abstract coordinator Junction^0, which projects to JunctionP. One possible way to implement this is an n-ary branching JunctionP, though this analysis is compatible with strictly binary branching as well.

(1)*My analysis of coordination*



It is worth mentioning that Al Khalaf (2005) arrived at a similar structure of coordination, where the coordinators are the daughters of the respective juncts, but she got to the analysis from evidence based on facts such as binding and selection. The fact that independent evidence converges on the same analysis further supports the structure proposed here.

But in English has at least three uses: counterexpectation, semantic opposition and correction (e.g., Toosarvandani's 2013, 2014 taxonomy). This chapter focuses on the corrective use of *but*. Each use of *but* requires contrast of some sort. In the counterexpectational use (e.g., *Max eats spinach but hates it*), the first conjunct (i.e., *Max eats spinach*) creates an expectation that is rejected by the second conjunct (i.e., *but hates it*). In semantic opposition, the conjuncts contrast with each other in two positions (e.g., *John is tall but Bill is short*). Corrective *but* requires presence of negation in the first conjunct and absence of negation in the second conjunct (2). Absence or

presence of negation in both conjuncts is not possible (3)–(4). For this reason, I also call corrective *but* sentences *neg(ation)…but…* sentences.[1]

(2)Max does**n't** eat spinach but chard.

(Toosarvandani 2013:828)

(3)#Max eats spinach but chard.

(4)#Max does**n't** eat spinach but **not** chard.

Vicente (2010) and Toosarvandani (2013) argued that (2) must involve ellipsis. For example, Toosarvandani would argue that the *remnant* (the phrase that survives ellipsis; *chard*) moves out of the ellipsis site, which then gets deleted.

(5)Max does [$_{vP}$ **not** eat spinach] but [$_{vP}$ chard$_i$ [~~eat t$_i$~~]].

Toosarvandani also discussed a type of corrective *but* sentences that is a minimal pair with (2), but puts negation before *spinach*:

(6)Max eats **not** spinach but chard.

He argued that (6) cannot involve ellipsis, and must be analyzed as coordination of two DPs, where the first DP is a negated DP.

(7)Max eats [$_{DP}$ **not** spinach] but [$_{DP}$ chard].

I agree with Toosarvandani on the analysis of (2), but not on the analysis of (6). In section 2, I will provide evidence that suggests that in addition to the analysis without ellipsis (8a), (6) can also be analyzed as underlying coordination of larger phrases (e.g., two vPs, (8b); or two TPs, (8c)) plus ellipsis. In order to license ellipsis, there must be an antecedent that is identical to the elided phrase. Thus, I assume that in (8b-c), *not spinach* moves at LF, and creates an antecedent that is identical to the elided phrase (i.e., *eats trace* and *he eats trace* respectively). I included this LF-movement in (8b-c), but for simplicity will not include it in most examples in this chapter.

(8)*My analysis of (6)*

a. Max eats [$_{DP}$ **not** spinach] but [$_{DP}$ chard].
b. Max [**not** spinach]$_i$ [$_{vP}$ eats t$_i$] but [$_{vP}$ chard$_i$ [~~eat t$_i$~~]].
c. [**not** spinach]$_i$ [$_{TP}$ Max eats t$_i$] but [$_{TP}$ chard$_i$ [~~he eats t$_i$~~]].

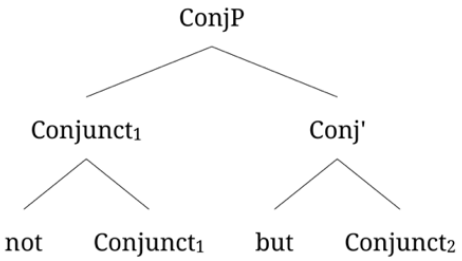
I analyze (2) as requiring ellipsis, but (6) as optionally involving ellipsis. This analysis, which assigns a single analysis to (2) but multiple possible analyses to (6), predicts that if the multiple possible analyses can lead to different meanings, then we should be able to observe ambiguity for sentences like (6), but only a single reading for sentences like (2). Section 4 shows that this prediction is borne out: in sentences like (2), negation and conjunction always take scope at their

[1] Here *neg…but…* only refers to corrective *but*, not counterexpectational *but*. Counterexpectational *but* doesn't require negation in the first conjunct, but can by accident, as in *Max doesn't eat burgers but he enjoys the taste*.

surface positions, but in sentences like (6), negation and conjunction can take scope at higher positions than their appear.

Not only does the evidence from section 4 support the analysis with ellipsis that section 2 argues for, but it also suggests that this ellipsis does not occur freely, but in a systematic way. Furthermore, facts based on scope also suggest that there is a close relationship between the position of negation and *but*-coordination. Negation always takes scope immediately below the conjunction, suggesting that negation is always the daughter of the first conjunct. *But* first merges with the second conjunct, and then merges with the merged product of negation and the first conjunct to derive the Conjunction Phrase (ConjP).

(9)*My preliminary analysis of corrective but coordination*



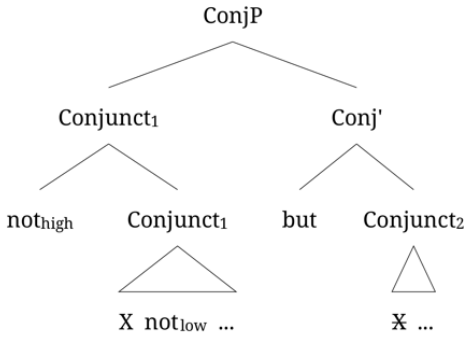
This analysis can account for the all the facts to be presented in this paper, except the fact that in sentences like (6), negation can take scope above its surface position. In (8b-c), negation is not the daughter of the first conjunct, but deeply embedded in it, contrary to my analysis in (9). But negation takes scope above its surface position, and directly below the underlying conjunction.

I therefore argue that in addition to ellipsis, there are actually two positions for negation: the higher position (which I call *high negation*) is interpreted, and is the daughter of the first conjunct. The lower position (which I call *low negation*) is semantically vacuous, and deeply embedded inside the first conjunct. Either position may be pronounced. When low negation is pronounced (pronounced negation is marked in italics, and silent negation in <>), because we do not see where high negation is, it has the effect that negation takes scope at a place higher than its surface position.

(10) *My analysis of (6) plus positions of negation*
   a. Max eats [$_{DP}$ **not** <not> spinach] but [$_{DP}$ chard].
   b. Max [$_{vP}$ <not> eats **not** spinach] but [$_{vP}$ chard$_i$ [~~eat t$_i$~~]].
   c. [$_{TP}$ <not> Max eats **not** spinach] but [$_{TP}$ chard$_i$ [~~he eats t$_i$~~]].

My full analysis is laid out below, incorporating both ellipsis (of identical material X) and the two positions of negation:

(11) *My full analysis of corrective but coordination*



There has been a generalization in the literature based on the Question-particle and *only* that all focus-sensitive operators have two instances in a sentence (e.g., Lee 2004, Cable 2007, Hole 2015, 2017, Hirsch 2017, Quek and Hirsch 2017, and Bayer 2018). I argue that negation in corrective *but* sentences is also a focus-sensitive operator, and that negation has two positions, consonant with this generalization.

This analysis of corrective *but* is identical to my analysis of *either…or…* in chapter 2, suggesting that negation, like *either*, has a close relationship with coordination. Parallel to the fact that *either* requires *or*, constituent negation requires *but*.[2]

[2] In contrast to constituent negation, sentence negation, *neither* and *not a single NP* can occur without *but*.

(i) a. Max doesn't eat spinach.
b. They had neither obsession nor attraction.
c. They saw not a single person.

Not {many/much/all/every} NP can occur without *but*, but only in the subject position (observed by Klima 1964; Postal 1974):

(ii) a. {Not many friends/Not all his friends/Not everybody} came to the party.
b. *John invited {not many friends/not all his friends/not everybody} to the party.
(Based on Kayne 1998:157)

No can occur in the object position without *but*, but only as the object of a verb that raises to T, e.g., *be* and *have*. When it is the object of a verb that doesn't raise to T, e.g., *become* and *own*, prosodic focus on the verb is required (observed by Bolinger 1977; Kayne 1998):

(iii) a. He {was/*became} no recluse.
b. He {has/*owns} no car.

I assume that the negation that can occur without *but* still has another form that is a coordinator and requires *but*. The negation that can occur without *but* is the non-coordinator homophone. I leave to future research exactly what types of negation have non-coordinator homophones and the conditions that license them. But I want to point out that the ungrammatical sentences above improve with *but*, suggesting that when negation is a coordinator, it is not subject to the restrictions that the non-coordinator form of negation is subject to.

(iv) a. John invited not all his friends but only some to the party.
b. He became no A+ student, but an A- student.

(12) a. Max eats either spinach *(or chard).
b. Max eats not spinach *(but chard).

Before delving into the data and analysis, I want to introduce some terminology that will aid in understanding the data. If we adopt my analysis that negation is the daughter of the first conjunct, then corrective *but* sentences can be divided into two types. Many corrective *but* sentences seem to follow the generalization that negation is the daughter of the first conjunct (e.g., (6)). I call these sentences *neg(ation)-seems-normal* because they seem to be the banal cases from the perspective of my analysis. Other corrective *but* sentences seem to challenge my generalization that negation is the daughter of the first conjunct (e.g., (2)) because there, negation appears to be higher than the daughter of the first conjunct. I call these sentences *neg(ation)-seems-high*. According to my analysis, neg-seems-high is an illusion: negation is still the daughter of the first conjunct, but this has been obscured by ellipsis.

Following are some examples of neg-seems-normal and neg-seems-high. They demonstrate that corrective *but* sentences do not require *not*, but can involve other negative elements (e.g., *no* and *neither*). They also show that neg-seems-normal does not require constituent negation, and neg-seems-high does not require sentence negation. According to Toosarvandani (2010), sentence negation appears in the canonical sentential position and optionally cliticizes as *n't*, while constituent negation immediately precedes the contrastively focused element.

(13) *Neg(ation)-seems-normal*
a. Max eats [$_{DP}$ **not** spinach] but [$_{DP}$ chard].
b. He was [$_{DP}$ **no** recluse] but [$_{DP}$ a man of the world acquainted with public affairs].
(Toosarvandani 2013:830, 842)

(14) *Neg(ation)-seems-normal*
a. They had [$_{DP}$ **neither** obsession **nor** attraction] but [$_{DP}$ real love].
b. Max does [$_{vP}$ **not** buy spinach] but [$_{vP}$ grows it].

(15) *Neg(ation)-seems-high*
a. Max does**n't** eat [spinach] but [chard].
b. He met **not** a friend [of a linguist] but [of a philosopher].

This analysis and the terminology are nearly identical to my analysis and terminology for *either* in chapter 2, which also has *either*-seems-normal (16) and *either*-seems-high (17).

(16) *Either-seems-normal*
a. Max eats **either** spinach or chard.
b. He was **either** a recluse or a man of the world acquainted with public affairs.
c. They had **either** obsession or real love.
d. Max **either** buys spinach or grows it.

(17) *Either-seems-high*
a. Max **either** eats spinach or chard.
b. He met **either** a friend of a linguist or of a philosopher.

There is, however, an important difference between *either…or…* and corrective *but*: there exists *either*-seems-low, sentences where *either* is embedded inside the first disjunct (18), but there is no *neg-seems-low*, sentences where negation is embedded inside the first conjunct (19). Horn (2001:404) and Toosarvandani (2013:859) reported sentences like (19) to be ungrammatical:[3]

(18) *Either-seems-low*
a. [$_{DisjP}$ [Max will either eat spinach] or [he will eat chard]].
b. Max [$_{DisjP}$ [either will eat spinach] or [he will eat chard].

(19) *Neg(ation)-seems-low*
a. *[$_{ConjP}$ [Max does**n't** eat spinach] but [he eats chard]].
b. *Max [$_{ConjP}$ [eats **not** spinach] but [eats chard].
c. *[$_{ConjP}$ [Max eats **not** spinach] but [he eats chard].

There are two possible ways to make sense of the ungrammaticality of neg-seems-low. First, in the second conjunct of corrective *but*, if ellipsis is licensed, then it must apply. If ellipsis is a binary feature, then perhaps corrective *but* selects for [+Ellipsis] complements. The other possibility is that corrective *but* selects for focused material, so that the sister of *but* (i.e., the second conjunct) must be focused. Assuming that in (19) *chard* is contrastively focused, this means that the second conjunct of *but* can only be *chard*, but not any larger phrase. In contrast, *or* does not care if its sister is focused. I discuss each hypothesis in more detail in section 7.1.

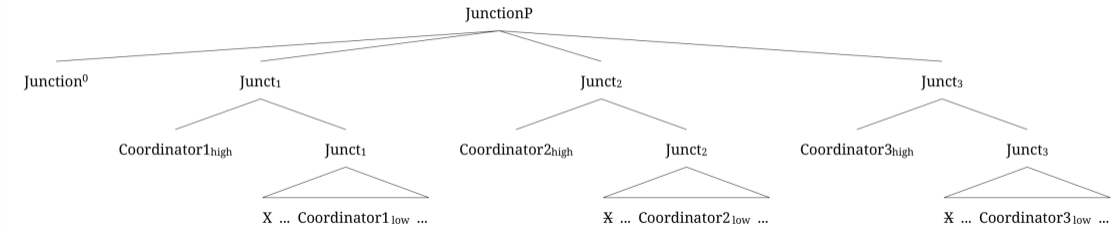
The fact that negation*…but…* has nearly identical analysis to *either…or…* has broad implications about "correlative coordination" generally. I call coordination whose presence of a coordinator depends on the presence of the other (e.g., *either…or…, both…and…, neg…but…, not only…but also…*) *correlative coordination*. The parallel behavior of *either…or…* and negation…*but*… suggests that perhaps all correlative coordination should have the same analysis–two positions for the first coordinator in the correlative coordination (i.e., *either, both,* negation) plus ellipsis.

Chapter 2 and most of this chapter focus on the syntax of the first coordinator (i.e., *either* and negation) and coordination of exactly two juncts (e.g., *John will eat either rice or beans*). Section 6 extends the analysis to the second coordinator (e.g., *or, and, but*) and coordination of more than two juncts (e.g., *John will eat either rice or beans or potatoes*). I will argue that the second coordinator has the same syntactic derivation as the first coordinator–two positions for the second coordinator, where the lower position is inside the second junct and c-commands focus, and the higher position is the daughter of the second junct. The only difference between the first and the second coordinators is that the second coordinator must be pronounced in its higher position, while the first coordinator can be pronounced in either of its two positions.

This leads to a generalized structure for coordination of n juncts (e.g., three juncts as in (20)). Each junct has a coordinator (e.g., *either* and *or*) has its daughter. The coordinators have a lower position that is deeply embedded in the respective junct. Ellipsis can occur in the non-initial juncts to obscure the higher position of the coordinators. These juncts then merge with a covert abstract coordinator Junction^0, which projects to Junction Phrase.

[3] (19a) may be okay under the counterexpectational reading, but not under the corrective reading. In other words, in a context where we do not expect Max to not eat chard just because he doesn't eat spinach, (19a) is not possible. For example, in a context where Max must eat either spinach or chard, (19a) is bad.

(20) *My analysis of correlative coordination of three juncts*



1.1. Comparison with previous proposals about corrective *but* sentences

Vicente (2010) and Toosarvandani (2013) have proposed analyses for corrective *but* sentences. My analysis differs from both accounts, but also overlaps with them in some parts. The following table compares their analyses of corrective *but* sentences with mine.

(21)

	Vicente (2010)	Toosarvandani (2013)	My analysis
(2) Max does**n't** eat spinach but chard.	CP-coordination with ellipsis	vP-coordination with ellipsis	vP-coordination with ellipsis
(6) Max eats **not** spinach but chard.	?	DP-coordination with no ellipsis	Multiple possible analyses: • DP-coordination with no ellipsis • vP-coordination with ellipsis • TP-coordination with ellipsis
(14) b. Max does**n't** buy spinach but grows it.	CP-coordination with ellipsis	CP-coordination with ellipsis	Multiple possible analyses: • vP-coordination with no ellipsis • TP-coordination with ellipsis
(15) b. He met **not** a friend of a linguist but of a philosopher.	?	DP-coordination with no ellipsis	DP-coordination with ellipsis

Vicente argued that corrective *but* always coordinates clauses, and when it appears not to, ellipsis has occurred. He would analyze (2) and (14b) as CP-coordination with ellipsis. He did not discuss sentences with constituent negation like (6) and (15b).

Toosarvandani, following McCawley (1991, 1998), divided corrective *but* sentences into two types, based on whether negation is sentence negation or constituent negation. Recall Toosarvandani's (2010) definition of sentence negation as negation that appears in the canonical sentential position and optionally cliticizes as *n't*, and constituent negation as negation that immediately precedes the contrastively focused element. He argued that corrective *but* sentences with sentence negation (e.g., (2)) always involves larger underlying coordination plus ellipsis,

while corrective *but* sentences with constituent negation (e.g., (6)) do not involve any ellipsis. He did not discuss sentences like (14b) and (15b), but I infer that he would say (14b) must involve ellipsis because it involves sentence negation, and (15b) cannot involve ellipsis because it involves constituent negation.

I agree with Vicente that (2) and (14b) involve ellipsis, but disagree on the size of the underlying coordination. I agree with Toosarvandani that corrective *but* can coordinate clauses (e.g., (2)) or subclauses (e.g., (6) and (15b)), but disagree on whether (6) has to be strictly DP-coordination, or it may be structurally ambiguous.

We also disagree on the analytical division of corrective *but*. Toosarvandani only studied sentences like (2) and (6), and claimed that they had different analyses because the former involved sentence negation, and the latter involved constituent negation. But once we take sentences like (14b) and (15b) into account, we will see that (14b) pattern with (6) in having ambiguity, even though (14b) involves sentence negation but (6) constituent negation; and (14b) patterns with (2) in requiring ellipsis, even though (14b) involves constituent negation but (2) sentence negation.

Therefore, I think the right way to divide corrective *but* sentences is not constituent vs. sentence negation, but the surface position of negation relative to the apparent conjunction (i.e., neg-seems-high vs. neg-seems-normal). Neg-seems-high must involve ellipsis, while neg-seems-normal can involve ellipsis, but doesn't have to.

Section 2 argues that corrective *but* sentences (both neg-seems-high and neg-seems-normal) can involve ellipsis, and section 3 argues that neg-seems-normal does not have to involve ellipsis. Because these claims overlap partially with Vicente's and Toosarvandani's analyses, some of the evidence will be replicated from them. Sections 4–5 present novel claims that have not been made before about corrective *but*: section 4 argues that negation has two positions in a sentence, and section 5 argues that negation is a focus-sensitive operator that needs to c-command the leftmost focus. Section 6 extends the analysis to the second coordinator and coordination of more than two juncts, which leads to a generalized analysis of correlative coordination. Section 7 concludes the paper, and compares corrective *but* sentences with *either…or…* sentences and with negative concord.

2. Evidence for ellipsis

This section presents five pieces of evidence that ellipsis can occur in both neg-seems-high and neg-seems-normal sentences, out of which four are replicated based on the evidence for ellipsis in *either…or…* in chapter 2. After arguing for the presence of ellipsis, I will show that this ellipsis involves a movement step that is subject to island constraints, thus calling for a stripping analysis that I proposed for *either…or…* in chapter 2–movement followed by phrasal ellipsis.

2.1. Argument 1 for ellipsis: Conjunction of "non-constituents"

The first argument relies on the assumption that only constituents can be coordinated by *but*. If we find apparent coordination of non-constituents, then ellipsis must have occurred. Following is a baseline, where the conjuncts (bracketed) are constituents:

(22) *Coordination of apparent constituents in neg-seems-high (baseline)*
   a. John did**n't** look at [the planet with ice caps], but [the star with dark spots].
   b. Mary did**n't** play [checkers from Egypt], but [chess from India].

(23) *Coordination of apparent constituents in neg-seems-normal (baseline)*
a. John looked at **not** [the planet with ice caps], but [the star with dark spots].
b. Mary played **not** [checkers from Egypt], but [chess from India].

In contrast, what appear to be coordinated in the following sentences are not constituents:[4]

(24) *Coordination of apparent non-constituents in neg-seems-high*
a. John did**n't** look at [the planet with a telescope], but [the star with binoculars].
b. Mary did**n't** play [checkers today], but [chess yesterday].

(25) *Coordination of apparent non-constituents in neg-seems-normal*
a. John looked at **not** [the planet with a telescope], but [the star with binoculars].
b. Mary played **not** [checkers today], but [chess yesterday].

If we posit ellipsis, then the underlying conjuncts are still constituents:

(26) *Apparent coordination of non-constituents must involve ellipsis in neg-seems-high*
a. John did**n't** [look at the planet with a telescope], but [~~look at~~ the star with binoculars].
b. Mary did**n't** [play checkers today], but [~~play~~ chess yesterday].

(27) *Apparent coordination of non-constituents must involve ellipsis in neg-seems-normal*[5]
a. John [looked at **not** the planet with a telescope], but [~~looked at~~ the star with binoculars].
b. Mary [played **not** checkers today], but [~~played~~ chess yesterday].

2.2. Argument 2 for ellipsis: Sloppy identity

The second piece of evidence relies on the fact that elided pronouns can have sloppy identity. The following neg-seems-high and neg-seems-normal sentences have both strict and sloppy readings, expected under ellipsis because elided pronouns give rise to both readings:[6]

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[4] The bracketed material in (25a) may be a constituent, if the sentence involves VP conjunction and ATB-movement of the verb (*looked*) and the preposition (*at*) out of the conjunction:

(i) John looked$_i$ at$_j$ not [$_{VP}$ t_i t_j the planet with a telescope] or [$_{VP}$ t_i t_j the star with binoculars].

While it is possible that the verb (*looked*) ATB-moves to v, there is unlikely to be another head position below v that the preposition can move to, therefore I consider the bracketed material not to be a constituent.

[5] I assume that in (27a-b), the remnants move out of the ellipsis separately, like what we see in gapping:

(i) a. John [looked at **not** the planet with a telescope], but [the star]$_i$ [with binoculars]$_j$ ~~looked at t_i t_j~~.
b. Mary [played **not** checkers today], but [chess]$_i$ [yesterday]$_j$ ~~played t_i t_j~~.

[6] Non-elliptical sentences can have sloppy identity, and thus sloppy identity readings have been suggested to not be a reliable diagnostic of ellipsis (Merchant 2013):

(i) a. Ralph ate his ice-cream with a spoon, and Seymour did the same thing.
b. Harvey stubbed his toe on the doorstop, and it happened to Max, too. (Merchant 2013:5)

The non-elliptical sentences that have the sloppy identity reading all involve lexical items such as *the same time*, *likewise* and overt pronouns. I take this to indicate that the sloppy identity reading requires ellipsis or such a lexical item. Since the second conjunct in (28) and (29) does not involve any such lexical item, it must involve ellipsis.

(28) Mary did**n't** expect John$_{iF}$ to like his$_i$ mother, but Bill$_F$. *Neg-seems-high*
a. Strict
Mary did**n't** expect John$_i$ to like his$_i$ mother, but ~~expect~~ Bill ~~to like his$_i$ mother~~.
b. Sloppy
Mary did**n't** expect John$_i$ to like his$_i$ mother, but ~~expect~~ Bill ~~to like his$_j$ mother~~.

(29) Mary expected **not** John$_F$ but Bill$_F$ to like his mother. *Neg-seems-normal*

2.3. Argument 3 for ellipsis: Subject quantifier

The third piece of evidence focuses on neg-seems-normal sentences, and puts a quantifier in the subject position, and neg…*but*… in the object position (30). (30) has multiple readings. Toosarvandani (2013) used one of them as an argument that neg-seems-normal does not have to involve ellipsis, which I will replicate in subsection 3.2. Here I focus on the other reading, spelled out below, where conjunction takes scope above the subject quantifier.

(30) At most five students drank **not** the whiskey but the gin. (Toosarvandani 2013:838)
✓∧ > ¬ > *at most five*: 'It's not the case that at most five students drank the whiskey, but it is the case that at most five students drank the gin.'

This reading may not be the most obvious one, but this context highlights it: the caterer is deciding what alcohol to serve at colloquium parties, and wants to eliminate the drink that is drunk by at most five students because it is not economical. The speaker can say (30) to argue for the elimination of gin but not whiskey. This reading follows naturally from ellipsis, but may be puzzling without ellipsis:

(31) *Analysis with ellipsis of (30)*
[At most five students drank **not** the whiskey] but [~~at most five students drank~~ the gin].

2.4. Argument 4 for ellipsis: Antecedent-contained deletion

The fourth piece of evidence relies on antecedent-contained deletion (ACD). I will show that an analysis without ellipsis runs into problems with sentences involving ACD, while an analysis involving ellipsis avoids these issues.

ACD often involves a relative clause that attaches to a DP, and VP-ellipsis in this relative clause (32a). Common analysis of ACD posits quantifier raising (QR) of the DP above the main verb (i.e., of *every philosopher that Mary did*, as in (32b)) in order to construct an antecedent VP (i.e., A in (32b), *talked to trace*) that is parallel to the elided phrase (i.e., E in (32b), *talk to trace*; Sag 1976, May 1985, Kennedy 1997, Fox 2002):

(32) a. John talked to every philosopher that Mary did.
b. John [every philosopher that Mary did [$_E$ ~~talk to t~~]]$_i$ [$_A$ talked to t$_i$].

Kennedy (1994) observed that if the DP that the relative clause attaches to is embedded in another DP, only the embedded DP can QR, but not the larger DP. I will apply this key observation to corrective *but* sentences that contain ACD:

(33) *ACD in corrective but sentences*
a. *Neg-seems-high*
John did**n't** talk to some linguist but every philosopher that Mary did.
b. *Neg-seems-normal*
John talked to **not** some linguist but every philosopher that Mary did.

According to Kennedy's observation, only the universal quantifier (i.e., *every philosopher that Mary did*) undergoes QR in (33), but not the larger DP conjunction. If we do not posit ellipsis for (33), then just QRing the universal quantifier would violate Coordinate Structure Constraint. Even if Coordinate Structure Constraint could be violated, it would lead to non-identical antecedent and elided phrase (34), where the antecedent is *talked to (not) some linguist but trace*, and the elided phrase is *talk to trace*.

(34) *Analysis without ellipsis creates non-identical antecedent and elided phrase*
a. John did**n't** [every philosopher that Mary did [$_E$ ~~talk to t~~]]$_i$ [$_A$ talk to [some linguist] but t_i].
b. John [every philosopher that Mary did [$_E$ ~~talk to t~~]]$_i$ [$_A$ talked to [**not** some linguist] but t_i].

If (33) can involve ellipsis, we can avoid these problems simply by positing larger underlying coordination, and movement of only the universal quantifier in the second conjunct:

(35) *Analysis with ellipsis*
a. *Neg-seems-high*
John did**n't** [$_{vP}$ talk to some linguist] but [$_{vP}$ [$_{DP}$ every philosopher that Mary did [$_E$ ~~talk to t~~]]$_i$ [$_A$ ~~talk to~~ t_i]].
b. *Neg-seems-normal*
John [$_{vP}$ talked to **not** some linguist] but [$_{vP}$ [$_{DP}$ every philosopher that Mary did [$_E$ ~~talk to t~~]]$_i$ [$_A$ ~~talked to~~ t_i]].

2.5. Argument 5 for ellipsis: Verb particle constructions

The fifth piece of evidence comes from verb particle constructions, which are replicated from Schwarz's (1999) and Han & Romero's (2004) arguments for *either…or…*. They observed that in verb particle constructions (e.g., *piss someone off*), it is worse to right-node-raise (RNR) a particle to a position above TP than to a position just above vP:

(36) a. This either pissed Bill or Sue off. (Schwarz 1999:357)
b. ??Either this pissed Bill or Sue off. (Schwarz 1999:360)

Assuming that in each sentence the particle *off* is RNRed out of each disjunct, and in each sentence *either* marks the left edge of the first disjunct, this means that it is worse to RNR the particle *off* to a position above TP than to a position above vP:

(37) This [$_{vP}$ either pissed Bill t_i] or [$_{vP}$ ~~pissed~~ Sue t_j] off$_{i,j}$. *Analysis of (41a)*

(38) ??[$_{TP}$ Either this pissed Bill t_i] or [$_{TP}$ ~~this pissed~~ Sue t_j] off$_{i,j}$. *Analysis of (41b)*

Thus, the (im)possibility of RNRing the particle is a diagnostic of underlying coordination size: if the particle can be RNRed across a coordination, then this coordination must be no larger than vP-coordination; if the particle cannot be RNRed across a coordination, then this coordination must be larger than vP-coordination, such as TP-coordination.

To apply this test to corrective *but* sentences, we need sentences where negation precedes a vP and those where negation precedes a TP or a larger phrase. But corrective *but* sentences do not allow pre-TP negation:

(39) a. *Not Bill arrived but Sue.
b. *Not Bill talked to John but to Sue.

Corrective *but* does allow pre-CP negation:

(40) a. Not John did Bill talk to but Sue.
b. Not only John did Bill talk to but Sue as well.

Thus, I use pre-CP negation here. Below I observe the parallel contrast with corrective *but* sentences:

(41) a. ***Not** Bill did this piss but Sue off.
b. This did**n't** piss Bill but Sue off.

If we take negation to mark the left edge of the first conjunct, then we can explain this contrast: it is bad to RNR the particle in (41a) because it involves large coordination (CP-coordination),[7] while we can RNR the particle in (41b) because it involves smaller coordination (vP-coordination).

(42) *[$_{CP}$ **Not** Bill did this piss t_i] but [$_{CP}$ Sue ~~this pissed~~ t_j] off$_{i,j}$. *Analysis of (41a)*

(43) This did [$_{vP}$ **not** piss Bill t_i] but [$_{vP}$ ~~pissed~~ Sue t_j] off$_{i,j}$. *Analysis of (41b)*

2.6. Ellipsis involves an island-bound movement

Having presented evidence that neg-seems-high and neg-seems-normal sentences can involve ellipsis, I will argue that this ellipsis involves a movement step that is subject to island constraints. Evidence for this movement comes from *neg*-seems-high sentences, where negation cannot be separated from the apparent coordination by a complex NP or an adjunct clause, which are known to be islands. Vicente (2010) and Toosarvandani (2013) have already made the observations about sentences involving sentence negation, which can cliticize as *n't*. Crucially, Toosarvandani

[7] I will argue later in section 4, following my analysis of *either…or…*, that negation has two positions, but only one position is pronounced. (42) has omitted the high, unpronounced position of negation. Following is my full analysis of (41a), including the high, unpronounced position (in <>). I assume that low negation forms a constituent with *Bill*. This negative DP (*not Bill*) has undergone negative inversion to Spec, CP, and triggers auxiliary inversion.

(i) [$_{CP}$ <Not> [not Bill]$_k$ did this piss t_k t_i] but [$_{CP}$ Sue ~~this pissed~~ t_j] off$_{i,j}$.

claimed that only these sentences can involve ellipsis. Here I show that the generalization is not about sentences with sentence negation, but really about neg-seems-high sentences. I also include the grammatical counterpart that is fine because it does not violate any island constraint.

In (44a-c) and (45a-b) the apparent coordination is *spinach but chard*. These sentences are bad because an island separates negation and that apparent coordination. This problem is fixed in (44d) and (45c) because the apparent coordination now includes the island (i.e., *his decision to eat spinach but his decision to eat chard* in (44d); *after eating spinach but after eating spinach* in (45c)), and therefore no island separates negation and that apparent coordination.

(44) *Neg and the apparent conjunction cannot be separated by a complex NP boundary*
a. *Max did**n't** revise [$_{NP}$ his decision to eat spinach] but chard.
b. Max revised [$_{NP}$ his decision **not** to eat spinach but chard].
c. Max revised [$_{NP}$ his decision to **not** eat spinach but chard].
d. Max did**n't** revise [$_{NP}$ his decision to eat spinach] but his decision to eat chard.

(45) *Neg and the apparent conjunction cannot be separated by an adjunct clausal boundary*
a. *Max did**n't** go home [$_{AdvP}$ after eating spinach], but chard.
b. Max went home [$_{AdvP}$ after **not** eating spinach, but chard].
c. Max did**n't** go home [$_{AdvP}$ after eating spinach], but after eating chard.

These facts follow from an ellipsis process in which the remnant (i.e., *chard* in (44a-c) and (45a-b); *his decision to eat spinach* in (44d); *after eating spinach* in (45c)) moves out of the ellipsis site before ellipsis takes place. (44a-c) and (45a-b) are ungrammatical because the movement of the remnant crosses an island boundary, and (44d) and (45c) are grammatical because this movement does not cross any island.

(46) *Analysis of (44a-d)*
a. *Max did [$_{ConjP}$ **not** revise his decision to eat spinach], but [chard$_i$ [$_{vP}$ ~~revised his decision to eat t$_i$~~]].
b. Max revised his decision [$_{ConjP}$ **not** to eat spinach, but [chard$_i$ [$_{TP}$ ~~to eat t$_i$~~]].
c. Max revised his decision to [$_{ConjP}$ **not** eat spinach, but [chard$_i$ [$_{vP}$ ~~eat t$_i$~~]].
d. Max did [$_{ConjP}$ **not** revise his decision to eat spinach], but [[his decision to eat chard]$_i$ [$_{vP}$ ~~revise t$_i$~~]].

(47) *Analysis of (45a-c)*
a. *Max did [$_{ConjP}$ **not** go home after eating spinach], but [chard$_i$ [$_{vP}$ ~~go home after eating t$_i$~~]].
b. Max went home after [$_{ConjP}$ **not** eating spinach], but [chard$_i$ [$_{vP}$ ~~eating t$_i$~~]].
c. Max did [$_{ConjP}$ **not** go home after eating spinach], but [after eating chard]$_i$ [$_{vP}$ ~~go home t$_i$~~]].

3. Evidence that neg-seems-normal sentences do not have to involve ellipsis

This section presents three pieces of evidence that neg-seems-normal sentences do not have to involve ellipsis. The second and third pieces of evidence are replicated from Toosarvandani (2013).

3.1. Argument 1: Verb particle constructions

The first piece of evidence is based on verb particle constructions. Recall from subsection 2.5 that if a particle can be RNRed across a coordination, then this coordination must be smaller than TP. Below, pre-DP negation and pre-vP negation permit RNRing the particle:

(48) a. This pissed **not** Bill but Sue off.
b. They did**n't** throw Bill but haul him out.

These are instances of neg-seems-normal. An analysis without ellipsis can account for the possibility of RNRing the particle. (48a) can be analyzed as DP-coordination (49a), which does not involve any RNRing, or as VP-coordination with RNRing across the coordinated VPs (49b). (48b) is analyzed as VP-coordination with RNRing (50).

(49) *Possible analyses of (48) as neg-seems-normal*
a. This pissed [$_{DP}$ **not** Bill] but [$_{DP}$ Sue] off$_{i,j}$.
b. This pissed [$_{VP}$ **not** Bill t_i] but [$_{VP}$ Sue t_j] off$_{i,j}$.

(50) *Analysis of (48) as neg-seems-normal*
This did[$_{vP}$ **not** throw Bill t_i] but [$_{vP}$ haul him t_j] out$_{i,j}$.

3.2. Argument 2: Subject quantifier

Recall (30), repeated below, which has a quantifier in the subject position, and neg…*but*… in the object position. As Toosarvandani (2013) observed, this sentence has a reading where the quantifier takes scope above conjunction and negation:

(51) At most five students drank **not** the whiskey but the gin.
(Toosarvandani 2013:838)
✓*at most five* > ∧ > ¬: 'There were at most five students who didn't drink the whiskey, and drank the gin.'

In this reading, the quantifier, negation and conjunction take surface scope. It follows from an analysis without ellipsis, where there is DP-coordination. While this DP-conjunction may need to QR to resolve the type mismatch, it QRs above *drank* and below the subject quantifier, so that the subject takes scope above this DP-conjunction:

(52) *Analysis with ellipsis of (30)*
At most five students [$_{DP}$ **not** the whiskey but the gin]$_i$ drank t_i.

3.3. Argument 3: Conjunction of numerals

The third piece of evidence relies on some neg-seems-normal sentences that can only be analyzed as small coordination with no ellipsis. This argument is replicated from Toosarvandani (2013), who in turn builds on Vicente's (2000) observation.

(53) Not three but four girls are sun-bathing on the lawn. (Vicente 2000:4000)
a. [Not three] but [four] girls are sun-bathing on the lawn.
b. *[Not three t_i] but [four t_j] [girls are sun-bathing on the lawn]$_{i,j}$.

Example (53) can only be analyzed as surface coordination without any ellipsis (53a). It cannot be analyzed as a larger underlying coordination because we would need to RNR a non-constituent *girls are sun-bathing on the law* (53b). Because only a single constituent can be RNRed, this analysis is ruled out. Even if we might be able to RNR multiple constituents separately such as the NP *girls* and the T' *are sun-bathing on the lawn*, it is generally not possible to rightward move the NP and strand the numeral quantifier:

(54) *I saw three t_i yesterday [girls who were sun-bathing on the lawn]$_i$.

4. Negation marks scope in neg-seems-high, but not neg-seems-normal

My analysis posits multiple possible analyses for neg-seems-normal (i.e., analyses with ellipsis, section 2, and analysis without ellipsis, section 3), but only one analysis for neg-seems-high sentences (i.e., analysis with ellipsis, section 2). This makes a prediction: neg-seems-normal sentences should be able to have ambiguity, but neg-seems-high sentences cannot have ambiguity. This section shows that this prediction is borne out. This behavior of corrective *but* sentences is identical to that of *either…or…* (first observed by Larson (1985) and further developed in chapter 2): the ambiguity of *either*-seems-normal and the lack of ambiguity of *either*-seems-high. Furthermore, I will argue based on the ambiguity of neg-seems-normal that there are two positions for negation in a sentence, though we only hear one, and only the higher position is interpreted as true negation.

Chapter 2 showed that *either*-seems-normal has ambiguity. So does neg-seems-normal. The key difference between the readings below is in the scope interaction between negation, conjunction and the intensional verbs (underlined and expanded in the readings). Negation and conjunction can take scope below both verbs (reading 1), between them (reading 2), or above them (reading 3).

(55) Sherlock pretended to be looking for **not** a burglar but a thief. *Neg-seems-normal*
✓Reading 1: Sherlock acted like he tried to find someone who is [**not** a burglar but a thief].
✓Reading 2: Sherlock acted like [he did**n't** try to find a burglar, but he tried to find a thief].
✓Reading 3: [Sherlock did**n't** act like he tried to find a burglar, but he acted like he tried to find a thief].

In contrast, neg-seems-high only has one reading, where the scope of negation and conjunction is frozen at negation's surface position (also observed by Kayne 1998):

(56) *Neg-seems-high that only has reading 2*
Sherlock pretended **not** to be looking for a burglar but a thief

(57) *Neg-seems-high that only has reading 3*
Sherlock did**n't** pretend to be looking for a burglar but a thief.

The only reading of neg-seems-high sentences follows from ellipsis, once we recover the elided material:

(58) *Analysis of neg-seems-high (56)*
Sherlock pretended [$_{TP}$ **not** to be looking for a burglar] but [$_{TP}$ ~~to be looking for~~ a thief].

(59) *Analysis of neg-seems-high (57)*
Sherlock did [$_{vP}$ **not** pretend to be looking for a burglar] but [$_{vP}$ ~~pretend to be looking for~~ a thief].

Reading 1 of neg-seems-normal (55) follows from the analysis without ellipsis:

(60) *Analysis without ellipsis of neg-seems-normal (55) → reading 1*
Sherlock pretended to be looking for [$_{DP}$ **not** a burglar] but [$_{DP}$ a thief].

Readings 2 and 3 of neg-seems-normal (55) follow from ellipsis, giving us higher scope of conjunction than its surface position:

(61) *Analysis with ellipsis of neg-seems-normal (55) → higher-than-surface scope of conjunction*
a. *Reading 2*
Sherlock pretend [to be looking for **not** a burglar] but [~~to be looking for~~ a thief].

b. *Reading 3*
Sherlock [pretended to be looking for **not** a burglar] but [~~pretend to be looking for~~ a thief].

Ellipsis can only give us the correct scope of conjunction in readings 2 and 3, but negation also takes scope at a higher position than its surface position. This suggests that we need something else besides ellipsis. Here I posit an instance of unpronounced negation (in <> in (62a-b)) at the left edge of the first conjunct. The unpronounced negation is interpreted as actual negation, and the pronounced negation is semantically vacuous.

(62) *Analysis with ellipsis of neg-seems-normal (55) → high-than-surface scopes of conjunction and negation*

a. *Reading 2*
Sherlock pretended [<not> to be looking for **not** a burglar] but [~~to be looking for~~ a thief].

b. *Reading 3*
Sherlock [<not> pretended to be looking for **not** a burglar] but [~~pretend to be looking for~~ a thief].

Now I discuss an alternative analysis that does not posit two positions for negation. A possible alternative (similar to Penka and Zeijlstra's (2005) analysis of negative indefinites in Dutch and German) is that there is no ellipsis at all, but just DP-conjunction *not a burglar but a thief*. This DP-conjunction QRs to above *looking for* (for reading 2) or *pretended* (for reading 3), and then each conjunct (the indefinites) is reconstructed.

(63) *Alternative analysis without ellipsis of neg-seems-normal (55) → Reading 2*
Step 1 (QR): Sherlock pretended [*not* a burglar but a thief]$_i$ to be looking for t_i.
Step 2 (reconstruction): Sherlock pretended [*not* a burglar but a thief]$_i$ to be looking for t_i [a burglar] [a thief].

This analysis fails to account for the evidence for ellipsis based on constituency, sloppy identity and ACD in section 2, and it also fails to account for neg-seems-normal with VP-conjunction (64), which can also have ambiguity, but VPs are usually assumed to not be able to QR:

(64) Sherlock <u>pretended</u> to be *not* singing but dancing.
✓Reading 1: Sherlock acted like he was doing something that was not singing but dancing.
✓Reading 2: Sherlock didn't act like he was singing, but he acted like he was dancing.

Having seen my analysis for neg-seems-high and neg-seems-normal, we may wonder why neg-seems-high can't have ambiguity. If it could, then (56) would have reading 3, contrary to fact:

(65) *Impossible reading 3 of (56)*
Sherlock [<not> pretended *not* to be looking for a burglar] but [~~pretended to be looking for~~ a thief].

This derivation is bad because ellipsis cannot apply here. Let us assume that in parallel to the movement of the remnant phrase *a thief, a burglar* moves to the parallel position in the first clause at LF:

(66) *Impossible reading 3 of (56)*
Sherlock [[a burglar]$_i$ <not> pretended not to be looking for t_i] but [[a thief]$_j$ ~~pretended to be looking for t_j~~].

Furthermore, suppose ellipsis requires syntactic identity between an antecedent and the elided phrase (i.e., *pretended to be looking for trace*). Because there is negation between *pretended* and

looking for in the first conjunct, but no negation in the second conjunct, we cannot find an antecedent that is identical to the elided phrase.

There might be a way to get around this issue, if we could also move *not to be looking for trace* above *pretended* in the antecedent and *to be looking for trace* above *pretended* in the elided phrase. This way, we could elide *to be looking for trace* under identity, and separately, *pretended trace* under identity:

(67) *Impossible reading 3 of (56)*
*Sherlock [[a burglar]$_i$ [not to be looking for t_i]$_k$ <not> pretended t_k] but [[a thief]$_j$ [~~to be looking for t_j~~]$_l$ ~~pretended t_l~~].

There are two possible reasons why this derivation is not possible. One is that it is not possible to Ā-move out of an Ā-moved phrase. In the antecedent, *not to be looking for trace* is in an Ā-position. This phrase contains the Ā-trace of *a burglar*. This violates the broader generalization that bans an Ā-moved element that contains another Ā-trace (Lasnik & Saito 1992, Takahashi 1994, Müller 1998 & 2010, Corver 2014, Bošković 2018, a.o.).

The other possible reason why this derivation is not possible is that the phrase that moves out of the ellipsis site may have to be focused. Here, *to be looking for trace* is not focused.

Having seen how the presence of negation can restrict ellipsis in neg-seems-high, we may now wonder if it might also restrict ellipsis in neg-seems-normal. Specifically, if it could restrict the derivations laid out in (62), that will prevent us from getting readings 2 and 3 for neg-seems-normal (55).

Below I lay out the movements of *a burglar* and *a thief* for (55). The presence of negation does not affect us here because *not* is adjacent to *a burglar*, and is pied-piped by the movement of *a burglar*. Since *not* moves out together with *a burglar*, there is a phrase that is identical to the elided phrase, and thus ellipsis is licensed.

(68) *Analysis with ellipsis of neg-seems-normal (55) → high-than-surface scopes of conjunction and negation*
a. *Reading 2*
Sherlock pretended [[not a burglar]$_i$ <not> to be looking for t_i] but [[a thief]$_j$ ~~to be looking for t_j~~].
b. *Reading 3*
Sherlock [[not a burglar]$_i$ <not> pretended to be looking for t_i] but [[a thief]$_j$ ~~pretended to be looking for t_j~~].

To summarize, this section has argued that the fixed scope of conjunction and negation in neg-seems-high is a result of ellipsis, but this ellipsis is restrained in a way that does not generate more readings than attested. The ambiguity of neg-seems-normal is a result of ellipsis, which is not restrained in the same way that neg-seems-high is, because of the pied-piping of *not* in the antecedent. In neg-seems-normal, not only can conjunction take higher scope, but negation also can, suggesting that there are two positions of negation, and the higher position is interpreted.

5. Focus sensitivity of negation

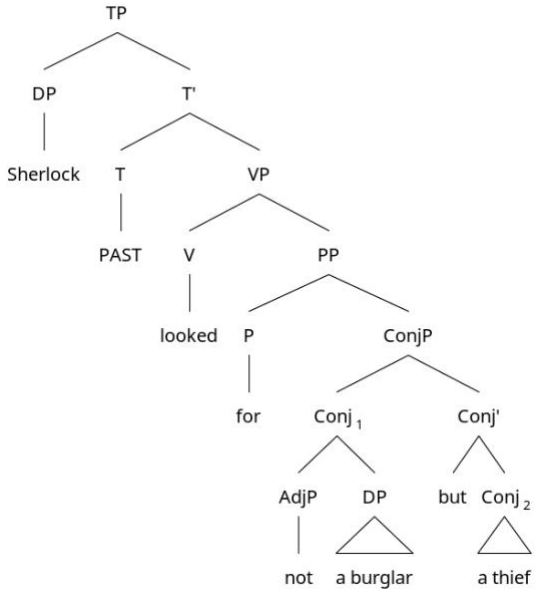
Having argued that negation has two positions in corrective *but* sentences, this section shows that the lower position must c-command focus, which is expected if the lower position is a focus-sensitive operator. Furthermore, it must c-command the leftmost focus, but does not need to c-command the other foci, a behavior identical to *either*'s behavior in *either…or…*.

Corrective *but* sentences always involve contrastive foci (e.g., the underlined phrases in *Max doesn't eat spinach but chard*). I will show that negation's lower position must c-command the leftmost focus (*spinach*), but does not have to c-command the other focus (*chard*). As we saw in (55), repeated below, negation there can be low negation:

(55) Sherlock looked for **not** a burglar but a thief.

If negation in (55) is low negation, it is embedded in the first conjunct, and thus only c-commands linearly the first focus *a burglar*, but not the second focus *a thief*:[8]

(69) *Syntactic tree of (55)*

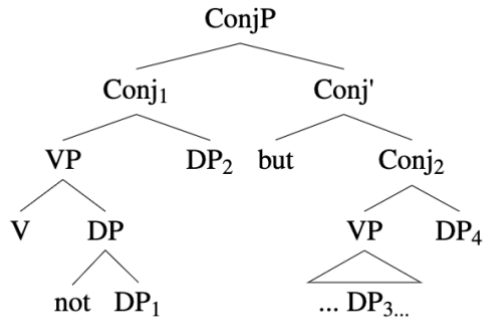


I will now put two foci in each conjunct, and make linearly the first focus structurally lower than the second focus. Then I will show that in this configuration, negation still only c-commands the leftmost focus, but does not need to c-command the other foci, even when the leftmost focus is not the structurally higher one.

The tree in (70) illustrates this configuration. Negation in (70) only c-commands DP_1, but not DP_2. If this configuration is grammatical with double focus on DP_1 and DP_2, then negation only needs to c-command the leftmost focus.

[8] We may wonder if high negation c-commands the second focus. It doesn't. Since high negation is the daughter of the first conjunct, it does not c-command any material in the second conjunct, including the second focus *a thief*.

(70) *Double-focus configuration*



I demonstrate with four different constructions, and begin with direct object plus a higher instrumental phrase (71), assuming that the direct object is structurally lower than the instrumental phrase.

(71) *Direct object + a higher instrumental phrase*
John looked at the planet with a telescope, and the star with binoculars.

Examples (72a-c) vary focus in this configuration:

(72) *Direct object + a higher instrumental phrase*
a. *Focus on Phrase1 & Phrase3*
John looked at [**not** the planet] with a telescope, but the star.
b. *Focus on Phrase2 & Phrase4*
*John looked at **not** the planet with a telescope, but with binoculars.
c. *Focus on Phrase1, Phrase2, Phrase3 & Phrase4*
John looked at [**not** the planet] with a telescope, but the star with binoculars.

Examples (72a-b) establish the fact that negation here only c-commands the direct object, but not the instrumental DP. (72a) only puts the direct object under focus, while (72b) only puts the instrumental DP under focus. (72a) is grammatical because negation manages to c-command the focused direct object, but (72b) is ungrammatical because negation fails to c-command the focused instrumental DP. (72c) puts both the direct object and the instrumental DP under focus. Its grammaticality suggests that negation only needs to c-command the direct object, which is the leftmost focus, but not the instrumental DP, which is the structurally higher focus.

I demonstrate this with three other constructions–direct object plus a higher temporal phrase (73), ditransitive (74) and ECM (exceptional case-marking; (75)).

(73) *Direct object + a higher temporal*
a. *Focus on Phrase1 & Phrase3*
John played [**not** checkers] today but chess.
b. *Focus on Phrase2 & Phrase4*
*John played **not** checkers today but yesterday.
c. *Focus on Phrase1, Phrase2, Phrase3 & Phrase4*
John played [**not** checkers] today but chess yesterday.

(74) *Ditransitive*
   a. *Focus on Phrase$_1$ & Phrase$_3$*
      John put [**not** a book] on the shelf, but the record.
   b. *Focus on Phrase$_2$ & Phrase$_4$*
      *John put **not** a book on the shelf, but on the table.
   c. *Focus on Phrase$_1$, Phrase$_2$, Phrase$_3$ & Phrase$_4$*
      John put [**not** a book] on the shelf, but the record on the table.

(75) *ECM*
   a. *Focus on Phrase$_1$ & Phrase$_3$*
      John considers [**not** the president] a fool, but his wife.
   b. *Focus on Phrase$_2$ & Phrase$_4$*
      John considers **not** the president a fool, but a genius.
   c. *Focus on Phrase$_1$, Phrase$_2$, Phrase$_3$ & Phrase$_4$*
      John considers [**not** the president] a fool, but his wife a genius.

6. Syntax of the second coordinator and coordination of more than two juncts

So far, chapters 2–3 and this chapter have focused on the syntax of the first coordinator (i.e., *either* and negation), but not the second coordinator (i.e., *or* and *but*). In many types of correlative coordination in many languages, the second coordinator appears in the same or related morphological forms as the first coordinator (e.g., 'either…or…' in French, Hebrew, Mandarin, Polish, Spanish). A simple analysis would consider the coordinators with the same morphological form as the same lexical item rather different ones, and thus assign the same analysis to them. This is the analysis I want to pursue here, and I want to adopt it not only for those languages, but also for languages that may realize the coordinators differently morphologically.

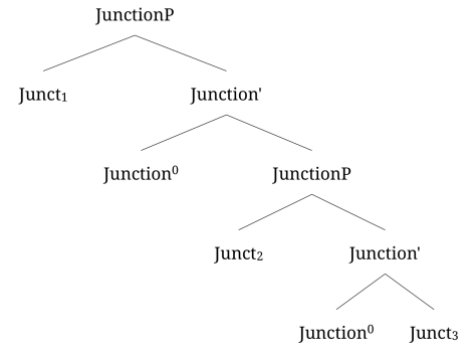
Generalizing the syntax of the first coordinator to the second, I will claim that the second coordinator occupies two positions in the second junct, one associating with the first focus in the second junct, and the other being the daughter of the second junct. The only difference is that unlike the first coordinator, which can appear overtly in either of the two positions, the second coordinator must appear in the higher position. The following schematizes my full analysis of *either…or…* and negation…*but*…, marking the high position and a possible low position of each coordinator (the foci are underlined):

(76) a. [$_{\text{Disjunct1}}$ Either$_1$ John will either$_2$ eat rice] [$_{\text{Disjunct2}}$ or$_1$ he will or$_2$ eat beans].
   b. [$_{\text{Conjunct1}}$ John will not$_1$ eat not$_2$ rice] [$_{\text{Conjunct2}}$ but$_1$ ~~he will eat~~ but$_2$ beans].

This analysis of the first and the second coordinators as the daughter of the respective junct differs from a common view of coordination in the literature, which considers the second coordinator (e.g., *and, or* and *but*) to be the head of the entire JunctionP. I briefly discuss theories that hold this view, and then contrast them with my analysis.

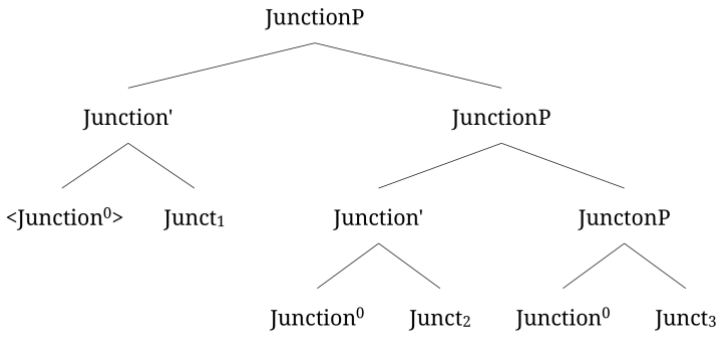
Johannssen (1998) focused on coordination where only the second coordinator is overt. She analyzed the second coordinator as the head of the JunctionP (*Junction^0*). The second coordinator takes the final junct as its complement, and the first junct as its specifier. When there are more than two juncts, there are recursive JunctionPs. Following is Johannssen's analysis of coordination.

(77) *Johannssen's (1998) analysis of coordination*



Collins (1988) proposed an analysis that is nearly the mirror image of Johannssen's. They agree that Junction^0 takes a junct as its complement and the other junct as specifier of recursive JunctionPs, but differ in where the specifiers are. For Johannssen, the specifiers are on the left, but for Collins, the specifiers are on the right.

(78) *Collins' (1988) analysis of coordination*

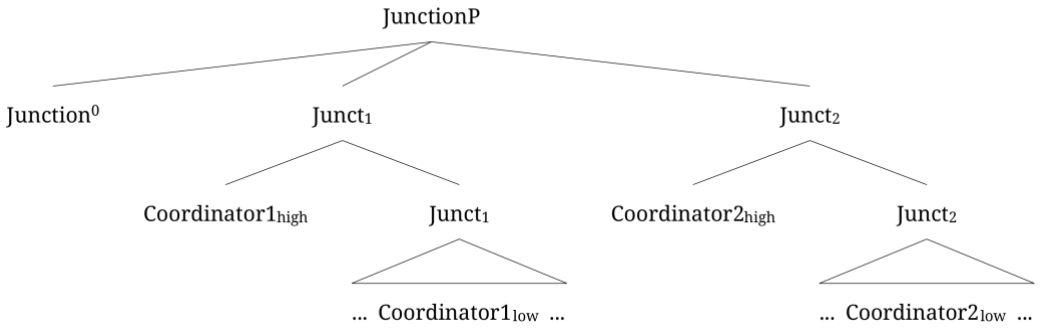


In contrast to these analyses, I do not consider the second coordinator to be Junction^0, but the daughter of the second junct, parallel to the first coordinator's position as the daughter of the first junct. Then what is the head of the JunctionP? I posit a covert abstract coordinator Junction^0 that takes the juncts as its sister, and projects to JunctionP.[9] One way to implement this is a ternary branching structure (79), where both juncts are the sister of Junction^0.[10] If we further assume that a head can select for its sister, then Junction^0 can select for each junct separately. If a Junction^0 selects for an *either*-disjunct and an *or*-disjunct, this creates the effect that *either* requires *or*. (79)

[9] In chapter 3, I suggested that the morphological similarity between the first and the second coordinators suggests that they agree with each other. I further argued that in order to agree with each other, the coordinators must have been part of the same JunctionP at some point. Under the view in (79), we can say that the agreement between the coordinators is actually mediated by Junction^0 because Junction^0 agrees with each coordinator.

[10] We can also implement this with strictly binary branching. One possibility is that the Junction^0 merges with a junct as its complement, and the other juncts as its specifier.

(79) *My analysis of coordination*



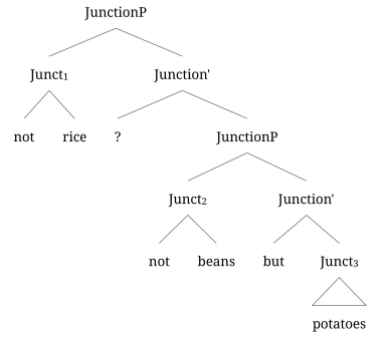
I will now provide an argument for my analysis (79) and against the others (77) and (78). For simplicity, I will focus on Johannssen's view (77), and contrast it with mine, though everything I say about Johannssen's theory should also apply to Collins'. This argument is based on data that an analysis that privileges the second coordinator (77) cannot derive, but an analysis that treats the first and the second coordinators equally (79) can.

The argument is based on corrective *but* sentences with more than two juncts (80).[11] For simplicity, let us focus on the parse of (80) as DP-coordination involving three DP juncts.

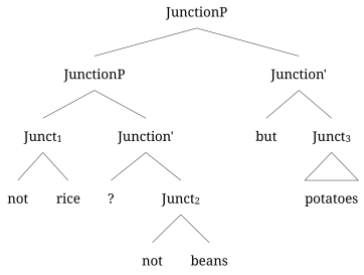
(80) John will eat not rice not beans but potatoes.

I will first discuss Johannssen's view and three potential structures that it could assign to (80), and then show that none of these three structures is possible. Focusing just on the DP-coordination, these three potential structures are: a right-branching structure (81a); a left-branching structure (81b); and a structure with two specifiers and a complement (81c).

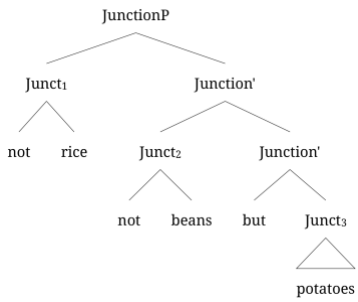
(81) a. *Right-branching structure*



(81) b. *Left-branching structure*



(81) c. *Two-specifier structure*



Structures (81a-b) are not possible. Johannssen would claim that a JunctionP must be headed by *but*. Thus, if there are multiple JunctionPs, there should be multiple *but*s. In (81a-b) there are two

[11] I am grateful to David Pesetsky for pushing me to think beyond two juncts, and for pointing out the fact to be discussed later that *but* cannot be repeated in corrective *but* sentences with more than two conjuncts, but *or* can in sentences with more than two disjuncts.

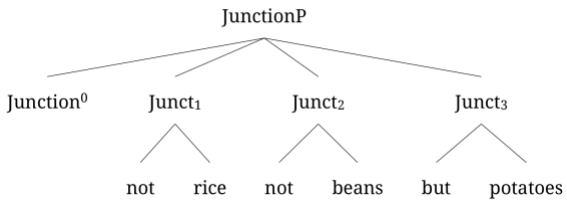
JunctionPs but only one *but*. In (81a-b) I put a question mark in the position that lacks an overt coordinator.

Sometimes *and* can be replaced by a brief pause (e.g., the comma in *John, Mary and Sue*), and we may wonder if the question mark in (81a-b) could be the pause that replaces *and*. It can't be because *and* can only be replaced by a pause if there is another *and* in the structure (e.g., **John, Mary*), and there is no *and* in (81a-b). This question mark cannot be covert *but*, either, even if we assume that corrective *but* can be covert. This is because corrective *but* requires negation in the first conjunct and no negation in the second, but there is negation in both conjuncts of the question mark.

Structure (81c) is not possible, either, based on independent evidence involving *either…or…*. If multiple specifiers were possible in coordination, then *or* should be able to take *potatoes* as its complement, and *either rice* and *either beans* as its two specifiers, but *John will eat either rice either beans or potatoes* is ungrammatical.

In contrast to Johannssen, my analysis, which treats the first and the second coordinators equally, can account for (80).

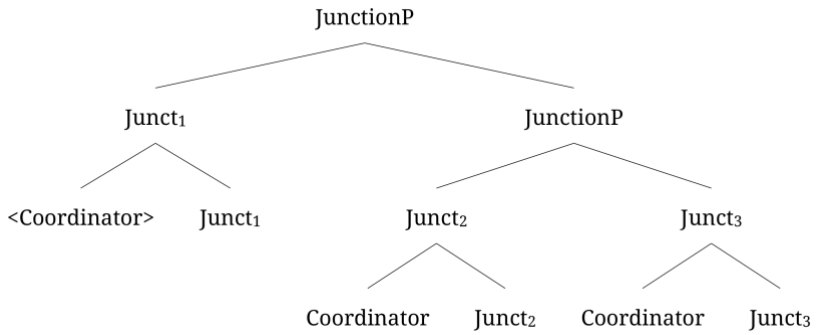
(82) *My analysis of* (80)



I have presented an argument supporting a syntactic structure of coordination where the coordinators are daughters of their respective juncts (79). Furthermore, the generalizations I made in this dissertation for *either* and negation (i.e., evidence for ellipsis, islands and scope) in coordination of two juncts can be replicated for the non-initial coordinators in coordination of more than two juncts, which also suggests that these coordinators should have the same analysis.

There were two other types of analyses of coordination in the literature that bear similarity to the present one, which I briefly discuss here. First, Al Khalaf (2015) also took the coordinators not as head, but as the daughter (specifically, adjunct) of each junct. She assumed a binary-branching structure where the last two juncts first merge, and their merged product then merges with the first junct.

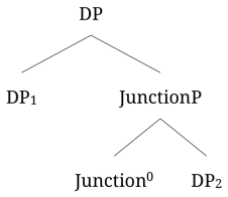
(83) *Al Khalaf's (2015) analysis of coordination*



Al Khalaf got to the analysis in (83) not from correlative coordination, but from independent facts based on phenomena such as binding and selection in coordination. The fact that we got to very similar structures from independent evidence provides further support for the idea that coordinators are daughters of the respective juncts. An important difference about Al Khalaf's analysis is that she did not study correlative coordination, and in fact claimed that English never realizes the first coordinator overtly (the angle brackets in (83) indicates that the first coordinator is not pronounced). I differ from her in claiming that English can realize the first coordinator as *both*, *either*, *not*, etc.

Another view in the literature considers coordination as adjunction of the second junct to the first (Munn (1992), (1993); Franks (1992), (1993), (1995); Bošković & Franks 2000; Hartmann 2000). These works focused on phenomena such as across-the-board (ATB) movement and binding in coordination, and claimed that the second junct is an adjunct to the first, and what appears as ATB-movement out of coordination actually involves a parasitic gap: the gap in the second junct is parasitic on the gap in the first. Following is their analysis of coordination of two DPs:

(84) *Adjunction analysis of coordination*



The adjunction analysis has focused on coordination of two juncts. By extension, I infer that it would analyze coordination of more than two juncts as low adjunction of the non-initial juncts on the right to the first junct. This analysis is similar to mine in that it assumes that the coordinator is the daughter of a junct (JunctionP in (84) is equivalent to a junct in my analysis). It differs from mine in that it does not study correlative coordination, and therefore we do not know how it would analyze the first coordinator like *both*, *either* and *not*.

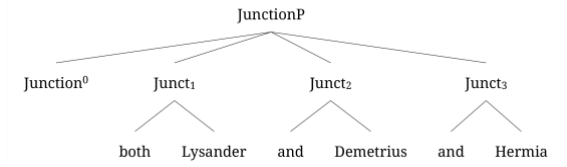
Having compared my analysis with previous ones, I just want to point out an interesting fact about coordination of more than two juncts that I think is worth further study: *or* and *not* are repeated instead of *either* and *but* (**John will eat either rice either beans or potatoes*; **John will eat not rice but beans but potatoes*). It may not be accidental whether the first or the last

coordinator is repeated for the middle conjuncts. Below I suggest two possible hypotheses about why *but* cannot be repeated, which might have the promise of being extended to *either*.

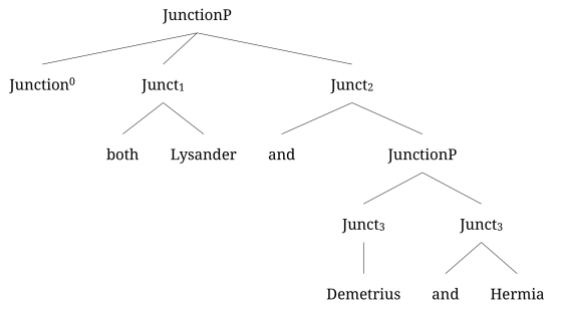
First, corrective *but* may require that its sister be the element that the predicate is exhaustively true of. This may be why it is ungrammatical to repeat *but* instead of *not*–having multiple *but*s violates that requirement. Note that *but* does not require there to be exactly one element that the predicate is exhaustively true of, however. For example, it is fine to have two things that the predicate is true of (*John will eat not rice but beans and potatoes*), but *but* requires that those three things constitute the set that the predicate is exhaustively true of. In contrast, negation does not impose the restriction that its sister is the only element that makes the predicate false. This hypothesis predicts that it is odd to say *John will eat not rice but beans. He will also eat potatoes* in the same way that it is odd to say *John will only eat rice. He will also eat potatoes*. Judgments here are quite delicate, which I will investigate these in the future.

The second hypothesis is that corrective *but* requires there be exactly one *but*-conjunct in a JuntionP. This might seem like merely describing the facts in different words, but if we examine *both*, it imposes precisely this type of cardinality restriction on conjuncts. *Both* requires there be exactly one *and*-conjunct in a JunctionP. For example, *Both Lysander and Demetrius and Hermia* is not a good answer to (A) if it involves coordination of three conjuncts in parallel (85), but it is good if it involves coordination of two conjuncts, one of which is a conjunction itself (86). (86) is natural in a context where Demetrius and Hermia are a couple.

(85) *Bad structure of both…and…*



(86) *Good structure of both…and…*



Thus, *both* has a cardinality restriction: *both*'s grandmother must immediately dominate exactly one *and*-conjunct. Following the view that conjuncts are selected for by a covert Junction^0, the Junction^0 which selects for a *both*-conjunct selects for exactly one *and*-conjunct. In parallel, corrective *but* requires its grandmother to dominate exactly one *but*-conjunct because the Junction^0 selects for exactly one *but*-conjunct.

I leave to future research exactly which hypothesis is correct, but this could shed light on why *either* cannot be repeated. The first hypothesis would say that *either* requires that its sister, together with the sister of *or*, be the element that the predicate is exhaustively true of. The second hypothesis would say that *either* requires its grandmother to dominate exactly one *either*-disjunct.

In this section, I have presented evidence based on corrective *but* sentences with three conjuncts that suggests that just like *either* and negation, *or* and *but* are the daughter of the respective disjuncts, contrary to the belief that *or* and *but* project to form the JunctionP.

7. Conclusion

This chapter has showed that negation, like *either*, has two positions in the sentence–the lower position is deeply embedded in the first conjunct and c-commands the leftmost focus, while the higher position is the daughter of the first conjunct. In addition, if the conditions on ellipsis are met, ellipsis must occur, and may obscure the position of negation. This analysis was then generalized to the second coordinator and coordination of more than two juncts. The following subsections compare corrective *but* with *either…or…*, and compare negation in corrective *but* sentences with negative concord.

7.1. Comparison with *either…or…*

My analysis of corrective *but* is almost identical to the analysis for *either…or…* proposed in chapter 2, with two differences. I first discuss the similarities and their consequences, and then the differences.

7.1.1. Generalized structure of correlative coordination and implications

Just like negation, I argued in chapter 2 that *either* also has two positions, and ellipsis can obscure their positions. Just like negation's lower position, *either*'s lower position is deeply embedded in the first junct and c-commands the leftmost focus.

One apparent difference between negation and *either* is the location of their higher positions, but there is also a view that is compatible with all the data so far that considers high negation and high *either* to occupy the same position in the structure. In chapter 2, I claimed that high *either* is the sister of the JunctionP. This seems to be a bit higher than where I claim high negation is–daughter of the first junct. But actually, evidence in chapter 2 was also compatible with a hypothesis where high *either* is the daughter of the first junct (see footnote 19 of chapter 2 for a discussion of this point). Evidence based on word order could not tell us exactly where high *either* is because nothing overt intervenes between the left edge of the disjunction phrase and the left edge of the first disjunct. But given that high negation must take scope below conjunction and therefore be the daughter of the first conjunct, and assuming that *either* has the same positions as negation, we could imply that high *either* might also be the daughter of the first disjunct. This leads to the same syntactic structure of *either…or…* and corrective *but*, and is in fact what I have assumed throughout section 6.

My analysis can be generalized beyond these two types of sentences to all correlative coordination (e.g., *both…and…* and potentially even comparatives *more / less…than…*) and across languages: perhaps in all types of correlative coordination, the coordinator has two positions, with the higher position being the daughter of the first junct, and the lower position being deeply embedded inside the first junct. Their positions may be obscured by ellipsis in the second junct.

Corrective *but* sentences appear to be quite different from *either…or…* sentences in many ways. For example, corrective *but* sentences involve conjunction, while *either…or…* sentences involve disjunction. The fact that independent evidence converges on the same analysis for these two types of sentences has implications for our understanding of how coordinated phrases can take scope. Previous analyses have tried to account for disjunction's ability to take scope at various positions by claiming that it is a result of the unique properties of disjunction (e.g., Schlenker (2006) and Charlow (2014)). In this chapter I observe that the scope of conjunction in corrective *but* sentences

parallels the scope of disjunction in *either…or…* sentences in many ways. This suggests that there is another mechanism that can derive the scope facts in coordination, which I argue is ellipsis. Crucially, if ellipsis can occur in sentences with conjunction, it should in principle be able to occur in sentences with disjunction as well.

In order to generalize the syntactic analyses of *either…or…* and corrective *but*, I proposed a view of *either* as the daughter of the first junct, which is different from the view in chapter 2. This might create a problem about my analysis in chapter 3. In chapter 3, I showed that *whether* and *neither*, which are variants of *either*, can pied-pipe the JunctionP. This follows naturally from the view in chapter 2 that *either* is the sister of the JunctionP. But now that we want to adopt a different view that *either* is the daughter of the first junct, how can variants of *either* pied-pipe the JunctionP from this position, assuming that elements can only pied-pipe their sister?

There are two possible ways to resolve this issue. The first is that *either* and negation may actually have three different positions in the structure–deeply embedded inside the first junct (either$_3$ / negation$_3$ in (87)), sister of the first junct (either$_2$ / negation$_2$ in (87)), and sister of the entire JunctionP (either$_1$ / negation$_1$ in (87))–but evidence from chapters 2 and 3 has located the lowest position and the highest position of *either* (either$_1$ and either$_3$), and evidence from this chapter has located the two lower positions of negation (negation$_2$ and negation$_3$).

(87) either$_1$ / negation$_1$ [$_{DisjP}$ [$_A$ either$_2$ / negation$_2$ … either$_3$ / negation$_3$ …] or / but [$_B$ …]]

The second possible solution to the issue is that the actual pied-piper is not *whether* / *neither*, but another covert focus-sensitive operator, which we can call the Question-particle and the negative-particle. This higher particle is in the sister of JuntionP, and therefore it pied-pipes the JunctionP, but since *whether* / *neither* is the daughter of the first junct, this creates the illusion that *whether* / *neither* pied-pipes the JunctionP.

7.1.2. Two differences between *either…or…* and neg…*but…*

Having discussed the parallel between *either…or…* and corrective *but* and its implications, I will now elaborate on their differences. First, there is *either*-seems-low, but no neg-seems-low. Second, there was evidence that the higher position of *either* is created by movement from the lower position, but we do not know if the two positions of negation are related.

As discussed in section 1, there is no neg-seems-low: negation cannot appear to be embedded in the first junct (19), but *either* can (18). Interestingly, Hebrew corrective *but* does not allow neg-seems-low, either, suggesting that the ban on neg-seems-low may be universal across languages. There are two possible ways to make sense of this.

The first solution is based on the description of the fact that if ellipsis can apply in the second conjunct of corrective *but*, then it must apply. Suppose ellipsis is a binary feature, and let us define the [Ellipsis] feature this way: in a [+Ellipsis] phrase, if the licensing conditions on ellipsis are met, then ellipsis must apply; but if the licensing conditions on ellipsis are not met, then there is no ellipsis. Then corrective *but* selects for a complement with [+Ellipsis] feature, while *or* does not care about the [Ellipsis] feature of its complement.

The second possible analysis of the absence of neg-seems-low is that corrective *but* selects for focused material (or [+Focus] complements, if focus is a binary feature), but *or* does not care about the focus feature of its complement.

In chapter 2, the argument that high *either* is derived by movement relied on island effects in *either*-seems-low. Since there is no neg-seems-low, we do not know whether high negation is derived by movement as well.

7.2. Comparison with negative concord

The two positions of negation I have proposed here bear similarity to negative concord. This subsection compares my analysis of corrective *but* sentences with Zeijlstra's (2004, 2008, 2012) analysis of negative concord. In Romance and Slavic languages, negative words that can create a negative meaning in isolation (e.g., *nikido* and *ne* in Czech) nevertheless lead to just a single semantic negation when co-occurring.

(88) a. Dnes nikdo *(ne)volá
Today n-body NEG.calls
'Today nobody is calling.'

b. Milan nevidi nikoho
Milan NEG.sees n-body
'Milan doesn't see anybody.'

c. Dnes nikdo *(ne)volá nikomu
Today n-body NEG.calls n-body
'Today nobody is calling anybody.' (Zeijlstra 2012:501)

Zeijlstra argued that all the negative words in (88) (which I call *negative concord items* or *NCIs*) have uninterpretable negative feature, and need to agree with covert semantic negation that is located high in the clause (e.g., <NEG> in (89)) in order to be licensed. This covert negation has interpretable negative feature, and c-commands all these NCIs.

(89) *Zeijlstra's analysis of (88c)*
[Dnes <NEG>$_{[iNEG]}$ [$_{TP}$ nikdo$_{[uNEG]}$ nevol$_{[uNEG]}$ nikoho$_{[uNEG]}$]]

Negative concord is similar to my analysis of negation here because in negative concord, semantic negation is covert and structurally higher than NCIs, which appear to be negative but are semantically non-negative. I also want to point out some differences between negative concord and negation in corrective *but*. First, Zeijlstra claims that the position of semantic negation is fixed–very high in what he calls Strict Negative Concord languages like Czech, and very high or in the middlefield above the auxiliary in what he calls Non-strict Negative Concord languages like Spanish or Italian. But in corrective *but* sentences, high negation's structural position is very flexible. Because high negation is the daughter of the first disjunct, high negation can be structurally very high (e.g., above TP) if the disjunct is large, and structurally quite low (e.g., below VP) if the disjunct is small. Second, NCIs can stack as in (88), but in each conjunct of corrective *but*, there can only be a single high negation and a single low negation. Third, according to Zeijlstra, NCIs are indefinites, but low negation in corrective *but* is semantically vacuous. Finally, we do not know if high negation is derived by movement in corrective *but* sentences, but if it is, then this

is another difference from negative concord, where the semantic negation is base-generated and relates to the NCIs by agreement, not movement.

Chapter 5
The sound of silence: Prosody of ellipsis

1. Introduction

Chapters 2 and 4 showed that we can detect ellipsis using syntactic diagnostics such as constituency. This chapter asks whether we can detect ellipsis prosodically. This question will have implications for both syntactic theories of ellipsis and theories of syntax-prosody mapping. If we can detect ellipsis prosodically, then we could develop a prosodic diagnostic for ellipsis, and add it to the toolkit of ellipsis diagnostics.

The question of the prosody of ellipsis might appear to be counter-intuitive at first because elided material is by definition silent. Because elided material has no phonological content, we might thus expect it to have no prosodic effects either. But prosodic effects are not just realized on pronounced material as *prominence effects*, they also include effects on the *prosodic boundaries* around (pronounced or potentially unpronounced) material. This can be demonstrated with a pair of fully overt examples (1a-b) as a baseline. They have different syntactic structures: (1a) is a coordination of two TPs, while (1b) can involve coordination of two DPs.

(1) a. [TP She went to the restaurant] and [TP she went there at midnight].
b. She went to [DP the restaurant] and [DP the giftshop].

This difference in syntactic structure is reflected in their prosody: *restaurant* in (1a) is followed by a larger prosodic boundary than *restaurant* in (1b), suggesting that the phrase in which *restaurant* is phrase-final in (1a) (i.e., *she went to the restaurant*) is larger than that in (1b) (i.e., *the restaurant*).

Many existing theories of syntax-prosody mapping can capture this prosodic difference (e.g., edge-based theory (Selkirk 1986, 1995 and others); Align and Wrap constraints (Truckenbrodt 1995, 1999); Match Theory (Selkirk 2009, 2011; Elfner 2012, 2015; Bennett et al. 2016; Ito & Mester 2013, 2015 and others); embedding-based mapping (Wagner 2010)). These theories fall into two types, and account for the prosodic difference in different ways. One type of theories (e.g., Elfner 2012, 2015 and Wagner 2010) allows recursive prosodic structure, by which I mean that a syntactic phrase that dominates another syntactic phrase corresponds to a stronger prosodic phrase than the embedded phrase. Because *she went to the restaurant* dominates *the restaurant*, the former phrase corresponds to a stronger prosodic phrase than the latter. This is the type of theory that I will adopt in this chapter, and it is also the theoretical assumption underlying the prosodic experiment I will present.

The other type of theories may or may not allow recursive prosodic structure, but it stipulates that a syntactic clause (e.g., *she went to the restaurant*) corresponds to a larger prosodic constituent than a syntactic subclause (e.g., *the restaurant*) (e.g., Selkirk 1986, 1995). This type of theories may be able to account for the results of the prosodic experiment to be presented, and may even be able to do so without telling us anything about the research question–whether elided material has prosodic representation. In section 6 I will discuss exactly how this type of theories accounts for the prosodic results and potential challenges to these theories.

For concreteness, I will begin by adopting one specific theory in the first type–Elfner's (2015) version of Match Theory. I will introduce the relevant components of Match Theory, and propose an auxiliary assumption that is necessary for independent reasons. Match Theory together with

this auxiliary assumption can capture the observed prosodic difference between (1a&b). After introducing the basic assumptions about the syntax-prosody mapping that I will adopt in this chapter, I will then present the main research question, and an experiment that addresses it.

Elfner's version of Match Theory posits that prosodic structure should replicate the dominance relations in the syntactic structure. Applying this requirement to coordination, this has the same effect as matching syntactic constituents to prosodic constituents. For example, a syntactic maximal projection (XP) is mapped to a phonological phrase (φ), and a syntactic head (X^0) is mapped to a prosodic word (ω).[1] But not all syntactic constituents are mapped onto prosody. An assumption crucial to the literature on syntax-prosody mapping (e.g., Nespor & Vogel 1986; Elfner 2012; Hamlaoui & Szendrői 2015, 2017) is that silent material (e.g., phonologically empty heads and their projections, and movement traces) is not mapped onto prosody, citing evidence from languages such as Chichewa (Truckenbrodt 1999) and Xiamen Chinese (Chen 1987; Lin 1994).

Following these principles that map overt syntactic phrases and heads to phonological phrases and words, (1a&b) have the following prosodic structures.[2] I map pronouns and prepositions to clitics (C) to represent the fact that they are prosodically weak, but exactly how they are mapped does not matter to us here because the strings under comparison (i.e., the strings up to *restaurant*) are string-identical: they have pronouns and prepositions in the same positions.

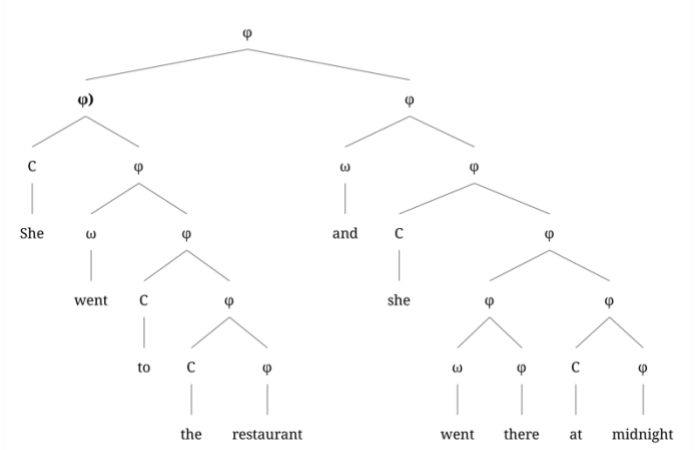


Figure 1: *Prosodic structure for (1a).*

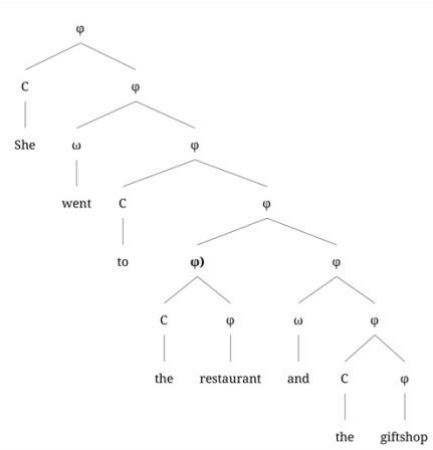


Figure 2: *Prosodic structure for (1b).*

[1] Elfner (2015) did not make a further distinction within XPs, and map syntactic clauses (TP or CP) and subclauses (e.g., VP and DP) to different prosodic constituents (i.e., intonational phrases (ι) and phonological phrases). Whether clauses and subclauses are mapped differently is not crucial for (1a-b), but will be crucial for sentences to be presented later that are the key minimal pair of this chapter. The original Match Theory did map syntactic clauses and subclauses to different prosodic constituents. This original version of Match Theory will not be able to tell us anything about the research question of this chapter. Section 6.2 shows why this is the case with a discussion of edge-based theory, which also distinguishes between clauses and subclauses. That discussion applies to any theory that does so.

Elfner's version of Match Theory may not need to distinguish between clauses and subclauses because she has enriched the theory by positing that phonological phenomena make reference to levels of embedding of φ. Under this enriched version of Match Theory, what used to be ι may be re-analyzed as maximal φ (i.e., φ not dominated by φ). If this is the case, it is worth re-evaluating the old evidence for intonational phrases ι, and asking if we can do without them. I leave this question to future research.

[2] Match Theory was actually based on Optimality Theory, a framework in which mapping principles may not be followed, if there are higher-ranked constraints. Based on empirical observations about English coordination, I assume that at least in this construction, the mapping principles are ranked highly enough that they are always followed.

1.1. Auxiliary assumption

These abstract prosodic structures have phonetic effects that we can hear. We thus need a theory that connects the prosodic structure to prosodic / phonetic effects in prominence and phrasing, such as effects in duration, pitch and intensity. In the tradition of Match Theory, there have been many proposals that connect the prosodic structure to categorical phonological processes such as the presence or absence of a segment or a tone, or the occurrence or blocking of sound change, but to my knowledge there have not been explicit proposals in Match Theory that connect the prosodic structure to *gradient* phonetic effects such as the degree of lengthening of a segment. For categorical phonological processes, Match Theory proposals simply stipulate the domains in which these categorical processes occur (e.g., Elfner 2015 stipulated that in Connemara Irish, a Low-High tone only occurs in a φ that dominates another φ). We cannot make such an analysis for gradient phonetic effects because they occur in every domain that has the same label (say, every φ), but crucially, these effects vary by the level of embedding of the prosodic domain.

In order to capture these gradient phonetic effects, I will add the following assumption to Match Theory: the more levels a node dominates in the prosodic structure, the phonetically "stronger" this node is. Phonetic "strength" can be reflected by phonetic effects at the left and right edges of this node, such as domain-final lengthening (e.g., Wightman et al. 1992). By this assumption, in a prosodic structure where a φ dominates another φ, the mother φ must be phonetically stronger than the daughter φ because the mother φ dominates one more level of φ than the daughter.

This assumption allows us to connect the abstract prosodic structure to gradient phonetic effects that we hear. Match Theory plus this auxiliary assumption is equivalent to Wagner's (2010) theory of syntax-prosody mapping in accounting for the phenomena in this chapter; they make different predictions for other phenomena that could be tested, which I discuss in section 6.1.

Having introduced Match Theory and the auxiliary assumption about mapping from prosodic structure to gradient durational effects, let us apply this framework to (1a&b). For our purposes, I will focus on the highest φs in which the word *restaurant* is final, which is *she went to the restaurant* in (1a) and *the restaurant* in (1b). The right boundary of these φs is marked in bold in Figure 1 and Figure 2 respectively. The φ *she went to the restaurant* in (1a) dominates four levels of φ, while the φ *the restaurant* in (1b) dominates one level. The strength of a phrase is reflected by lengthening effects: as Wightman et al. (1992) showed, the final rime of a word is lengthened before a phrase boundary, and the stronger / larger this boundary, the longer the rime. Because *restaurant* in (1a) is followed by a stronger phrase boundary than that in (1b), we would thus expect the last rime of *restaurant* in (1a) to be longer than that in (1b).

Having shown how Match Theory along with my auxiliary assumption can capture the prosodic difference between (1a&b), I now present the main research question of this chapter–that is, whether elided material has prosodic representation. To answer this question, we would need to compare the prosody of a sentence without ellipsis (1a) with one with ellipsis (2). (2) may be strange out of the blue, but it can be the answer to the question *Where did she go?*

(2) The restaurant and she went there at midnight.

When (2) is the answer to this question, the first conjunct of (2) is called a *fragment answer*. Assuming that answers to questions are proposition denoting constituents (e.g., (3B1)), fragment answers are answers that nevertheless appear as a part of a proposition (e.g., (3B2)).[3]

(3) A: Where did Loretta go?
B1: She went to the restaurant.
B2: The restaurant.

A common analysis of fragment answers posits that they are still a full clause, but with clausal ellipsis (e.g., Merchant 2004). Under this analysis, (2) involves movement of *the restaurant*, the phrase that survives ellipsis (*the remnant*), to a higher position (e.g., Spec, CP), plus deletion of the clause *she went to trace* (deleted material is struckthrough).[4]

(4) [$_{CP}$ [The restaurant]$_i$ ~~she went to t$_i$~~] and she went there at midnight.

The prosodic structure for (4) depends on whether elided material is represented in the prosodic structure. If it is represented, then we should get to a prosodic structure similar to that for (1a) (Figure 3, where the relevant φ, in bold, dominates two levels of φ). If elided material is not represented in the prosodic structure at all, then we will get to a prosodic structure where the relevant φ dominates fewer levels (just one, Figure 4).

[3] Not everyone assumes that answers must be propositional. For example, Groenendijk & Stokhof (1984), Ginzburg & Sag (2000), Jacobson (2016) and others argued that there is no elided material in fragment answers at all. A discourse rule combines the meaning of the fragment answer itself with the meaning of the question. The results of my experiment that fragment answers do contain additional prosodic structure will pose challenges to this theory of fragment answers.

[4] Not all syntactic analyses of fragment answers posit movement. We can imagine a different, in-situ analysis of fragment answers (e.g., Griffiths 2019), where the remnants of ellipsis stay in-situ, and ellipsis deletes the rest of the material:

(i) *In-situ syntactic analysis of (3B2)*
[$_{TP}$ ~~She went to~~ the restaurant].

I do not discuss this analysis in detail because it leads to the same results as an analysis that posits movement.

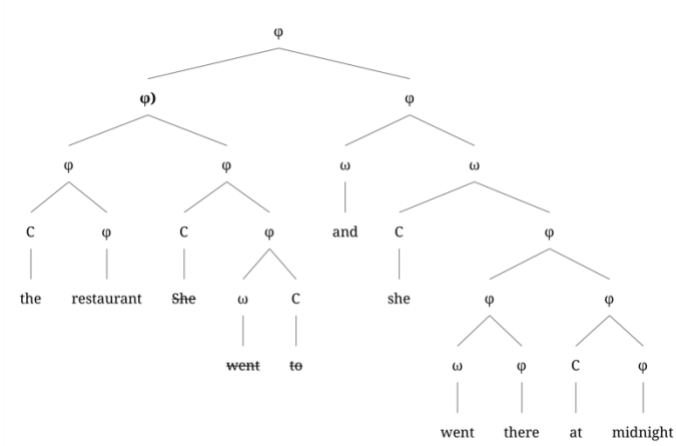


Figure 3*: Prosodic structure for (2), if elided material is represented in the prosodic structure*.

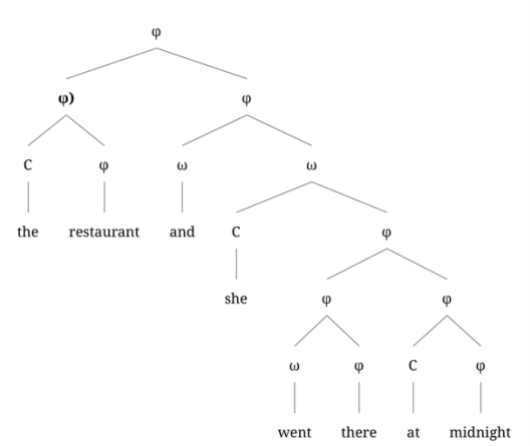


Figure 4: *Prosodic structure for (2), if elided material is not represented in the prosodic structure.*

1.2. Previous research: Prosody of gapping

Comparing Figure 1 on the one hand with Figure 3 and Figure 4 on the other, we reach a broader generalization: if elided material is not represented prosodically, we should expect the prosodic structure containing elided material (Figure 4) to have fewer levels of embedding, and therefore less prosodic structure than the structure that does not contain elided material (Figure 1). This could lead to observable effects in categorical processes (e.g., we might expect a phonological process that is otherwise blocked by a prosodic boundary to not be blocked under ellipsis because that prosodic boundary may not be present any more) and gradient processes (e.g., less degree of lengthening under ellipsis). On the other hand, if elided material is represented prosodically, we should expect a sentence with ellipsis (Figure 3) to not differ prosodically from a sentence without ellipsis (Figure 1, modulo possible prosodic differences due to remnant movement in ellipsis).

There has not been a lot of prior research on whether elided material has prosodic representation, and which of these hypotheses is correct. Cooper & Paccia-Cooper (1980) was the only work on this to my knowledge. They focused on gapping by comparing a sentence with gapping (5b) with one without gapping (5a), and actually found more prosodic structure with ellipsis, an outcome not predicted by either hypothesis discussed so far. Specifically, they found that a gapped verb or noun (what they took to be the location of the gapped verb is struckthrough in (5b)) lengthens the preceding word (i.e., *Kate*, underlined, is longer in (5b) than in (5a)), and also creates a pause before the gapping site (i.e., there is more likely to be a pause following *Kate* in (5b) than (5a)).

(5) a. My cousin Jane completed Allen's story and my aunt <u>Kate</u> completed Ed's poem.
b. My cousin Jane completed Rita's story and my aunt <u>Kate</u> ~~completed~~ Carmella's new poem.

Sentences (5a-b) do not actually bear on the research question here due to confounds associated with gapping. Common analyses of gapping (Sag 1976 and subsequent work) do not analyze (5b) as simple deletion of the verb head itself, but posit rightward movement of *Carmella's new poem* before ellipsis:

(6) My cousin Jane completed Rita's story and my aunt Kate ~~completed t_i~~ [Carmella's new poem]$_i$.

If this rightward movement creates prosodic structure (e.g., Selkirk 2002 showed that Right Node Raising almost always creates a large prosodic boundary before the raised material[5]), then the additional prosodic structure observed by Cooper & Paccia-Cooper might not be a result of ellipsis, but of rightward movement. Furthermore, there are still debates about whether gapping actually involves ellipsis at all: Johnson (1994, 2004, 2006, 2009), for example, argued that gapping is not ellipsis, but actually involves across-the-board movement of the verb or the vP (*completed* or *completed trace* in (7)). If he is right, then the prosody of gapping does not bear on the prosody of ellipsis after all.

(7) My cousin Jane [completed $t_{i,j}]_k$ t_k [Rita's story]$_i$ and my aunt Kate t_k [Carmella's new poem]$_j$.

1.3. Case study on fragment answers

Due to the complications associated with gapping described in subsection 1.2, I will focus on clausal ellipsis instead, a less controversial type of ellipsis with fewer movement steps. I will use fragment answers, a type of clausal ellipsis, as the critical case study.

I will present an experimental study that asks if having a fragment answer would affect the prosody of the sentence. I do not directly compare the prosody of a fully overt sentence with its counterpart with ellipsis, however, because everything else being equal, the sentence without ellipsis will have more overt material than its ellipsis counterpart, and the length of overt material affects prosody (e.g., Gee & Grosjean 1983; Jun 2000, 2003; Selkirk 2000; Watson & Gibson 2005). Instead, I will look at a difference between overt structures, and ask if that difference is still present between structures that contain ellipsis. In other words, I will compare the difference between differences.

The key difference between (1a&b) is the presence of clausal structure in the first conjunct in (1a) but not in (1b). The experiment makes that clausal structure silent by ellipsis (8B1) by making the sentence a fragment answer to the question (8A), and asks if the prosodic difference that we heard between (1a&b) is still present for (8B1&B2). To ensure that the sentences are still a minimal pair and have the same surface structure and length, the other sentence (8B2) also has ellipsis, but ellipsis occurs outside the first conjunct, so that when we just look at the first conjunct (i.e., materials in the first brackets in (8B1-B2)), (8B1) has clausal structure but not (8B2).

(8) A: Where did Loretta go?
B1: The restaurant and at midnight.
B2: The restaurant and the giftshop.

[5] Selkirk (2002) analyzed this prosodic boundary as a result of focus, not of the movement. Appendix B presents an experimental study on precisely this question, that is whether focus can create phrasing. I found no evidence that it can. Even if the boundary observed by Selkirk in Right Node Raising is a result of focus rather than movement, it does not affect us here. My point is that the prosodic boundary observed for (5a) may not be due to ellipsis, but something else. It could be due to rightward movement, or due to the focus on *my aunt Kate*.

Following are the syntactic analyses of (8B1-B2), assuming that fragment answers involve movement plus deletion:

(9) a. *Syntactic analysis of (8B1)*
[$_{CP}$ [The restaurant]$_i$ ~~she went to t$_i$~~] and [$_{CP}$ [at midnight]$_i$ ~~she went there t$_i$~~].
b. *Syntactic analysis of (8B2)*
[$_{CP}$ [[$_{DP}$ The restaurant] and [$_{DP}$ the giftshop]]$_i$ ~~she went to t$_i$~~].

If elided material is represented in prosody just like overt material, then we should expect the prosodic difference observed in (1a-b) to still hold for (8B1-B2). On the other hand, if elided material is not represented in prosody at all, the prosodic difference will be neutralized in (8B1-B2).

1.4. Implications for syntax and syntax-prosody mapping

Whether elided material is represented prosodically has implications for both syntactic theories of ellipsis and theories of syntax-prosody mapping. There have been debates about whether elided material is represented in syntax. Some have argued that it is fully present in narrow syntax, but later deleted at PF (*PF-deletion*, e.g., Johnson 2001; Merchant 2001, 2004; van Craenenbroeck 2010). Others claimed that it is not present in syntax at all, but generates meaning by being copied at LF (*LF-copying*, Chung, Ladusaw & McCloskey 1995). There are also intermediate theories that have claimed that it is partially present in syntax (e.g., as a pronoun, Landau 2021). Assuming that prosodic structure is mapped from syntactic structure, if we can find prosodic effects of ellipsis, then elided material must be present in syntax in order to be mapped onto prosody, thus supporting full or partial syntactic representation of ellipsis, and challenging LF-copying.

Besides having implications for syntactic theories of ellipsis, this research is also the first step to understanding how syntactic structure, especially silent syntactic structure, is mapped onto prosody. A crucial assumption in the literature on syntax-prosody mapping (e.g., Chen 1987; Lin 1994; Truckenbrodt 1999; Elfner 2012; Hamlaoui & Szendrői 2015, 2017) is that not all material present in syntax is mapped onto prosody–silent material, such as empty heads and their projections and movement traces, is not mapped onto prosody. On the other hand, there have been arguments for the reality of movement trace based on prosody, which assume that traces do affect prosody (e.g., *wanna*-contraction, Lakoff 1970; Chomsky & Lasnik 1978; Jaeggli 1980; but see alternative analyses involving restructuring, cliticization, morpholexicon, etc., e.g., Postal & Pullum 1982; Aoun & Lightfoot 1984; Lobeck & Kaisse 1984; Goodall 1991; Pullum 1997). Compared to empty heads and movement traces, ellipsis has received little attention in this regard. If we can find prosodic effects of ellipsis, then at least some kind of silence has prosodic representation.

2. Methods

2.1. Materials

The materials consisted of 20 target sentences (2 coordination types x 2 condition types x 5 sets). Following is an example set of items, arranged by factorial design. In each cell, the first row is the

materials presented to the subjects, and the following rows are their syntactic analysis, which was not presented to the subjects. Section 8 presents all 5 sets of items.

	Critical Condition	**Control Condition**
Clausal coordination	(10a) The restaurant and at midnight. [$_{CP}$ [The restaurant]$_i$ ~~she went to t$_i$~~] and [$_{CP}$ [at midnight]$_i$ ~~she went there t$_i$~~].	(10c) She went to the restaurant and at midnight. She went to the restaurant and [$_{CP}$ [at midnight]$_i$ ~~she went there t$_i$~~].
DP coordination	(10b) The restaurant and the giftshop. [$_{CP}$ [[$_{DP}$ The restaurant] and [$_{DP}$ the giftshop]]$_i$ ~~she went to t$_i$~~].	(10d) She went to the restaurant and the giftshop. She went to [$_{DP}$ the restaurant] and [$_{DP}$ the giftshop].

The items varied by coordination type: (10a&c) must be analyzed as clausal coordination, while (10b&d) can be analyzed as DP coordination. Previous experimental work by Lehiste (1973), Ladd (1988), Féry & Truckenbrodt (2005), Wagner (2005, 2010) and others showed that in coordination, there is a close correspondence between syntactic structure and prosodic structure. We should therefore expect the difference in coordination size to be reflected in prosody, leading to a prosodic difference between (10a&b) (*Critical Condition*), and between (10c&d) (*Control Condition*).

But the Critical Condition (10a&b) differs not only in the underlying syntactic structure, but also in whether there is ellipsis in the first conjunct. I only look at the first conjunct here because the critical prosodic difference I am interested in is the prosodic boundary immediately following the first conjunct (i.e., the right boundary after *restaurant*). The presence of ellipsis in the first conjunct in (10a) but the absence of ellipsis in the first conjunct in (10b) have obscured their underlying syntactic difference: on the surface, they appear to be very similar, as surface coordination of two phrases with the same length.

Does their prosody only depend on pronounced structure, in which case we do not expect to find any significant prosodic difference between (10a&b) because they have the same surface structure? Or, does their prosody depend on both overt and silent syntactic structures, in which case we expect a prosodic difference between (10a&b)? The Critical Condition can thus tell us if prosody might be affected by underlying syntactic structure, even if that structure may not be pronounced. If there is no significant difference in prosody between (10a&b), then this suggests that prosody depends only on overt syntactic structure, but not silent structure.

If, on the other hand, there is a significant prosodic difference between (10a&b), then this is compatible with the hypothesis that prosody depends on underlying syntax, whether or not that syntactic structure is pronounced. If we do find a significant difference between (10a&b), we can further ask what is the source of that difference, by comparing the difference within the Critical Condition with that of the Control Condition (10c&d). Since the prosodic difference in the Control Condition is due to syntactic structures, if the difference in the Critical Condition is comparable to the difference in the Control Condition, then the reason for the difference in the Critical Condition might also be their syntactic structures. Then we can say that even though ellipsis creates similar surface structures, the underlying structure is still present in prosody, including the elided material.

Each target sentence was shown to the subjects along with a leading context sentence and a *wh*-question to elicit the intended information structure in the target sentence. For example, for (10a), the following materials were presented to the speaker. Every set of items (e.g., (10a-d)) had the same context and question.

(10a) Context: Loretta has disappeared.
Question: Where did Loretta go?
Answer: The restaurant and at midnight.

The speaker was to read the context silently, and say the question and the answer in the given order. There were 88 filler items, some of which contained a context, a question and an answer, and others lacked a context.

2.2. Participants

I conducted a production study with six native speakers of North American English, who were all graduate students at MIT. They were remunerated a small sum for their time, and granted their written consent to being tested.

2.3. Data collection

Due to the pandemic, participants did the recording at their own homes following step-by-step instructions on how to set up the recording environment. They looked for a place at home with the least reverberation possible (e.g., a place with a lot of soft furniture), and sat in front of a computer that displayed one context-question-answer trio at a time. The stimuli plus fillers were presented in a pseudo-randomized order, so that minimal pairs were not placed next to each other. Participants were given instructions about the task at the beginning of the experiment, and asked to read quietly to themselves before reading out loud each trio. They were encouraged to act out the dialogues naturally rather than reading mechanically.

2.4. Data analysis

Two research assistants labeled manually in Praat the last rime of the word immediately before the prosodic boundary (e.g., for (10a-d), *ant* of *restaurant*) and the pause after that word (e.g., for (10a-d), the pause following *restaurant*), if there is such a pause. Their annotations for the same segment differed by 13.7ms on average, and my data analysis was based on the more seasoned annotator's work. When labeling the rimes, we relied on cues to segmental boundaries. For example, the criterion for the end of *lettuce* is the end of frication noise.

I fitted 2 linear mixed effects models, with the duration of the last rime and the duration of the pause as the dependent variable in each model, and coordination (clausal vs. DP) and condition (critical vs. control) as fixed effects. I calculated p-values using using Satterthwaite's degrees of freedom method. The models included random intercepts and slopes by speaker and item group where those effects didn't result in a singular fit.

2.5. Predictions

Wagner (2005, 2010) and others have already found a close correspondence between syntax and prosody in coordination. We expect this effect to be replicated for the Control Condition as a significant prosodic difference between coordination types within the Control Condition, which would be realized as a longer rime and pause for clausal coordination (10c) than for DP-coordination (10d).

The question is whether there is also a significant prosodic difference within the Critical Condition, and if so, how that difference compares with the difference within the Control Condition. If there is no significant difference within the Critical Condition (Figure 5), then elided material may not be present in the prosodic structure. This implies that either elided material is not present in syntax to begin with, or elided material is present in syntax, but ignored by the syntax-prosody mapping.

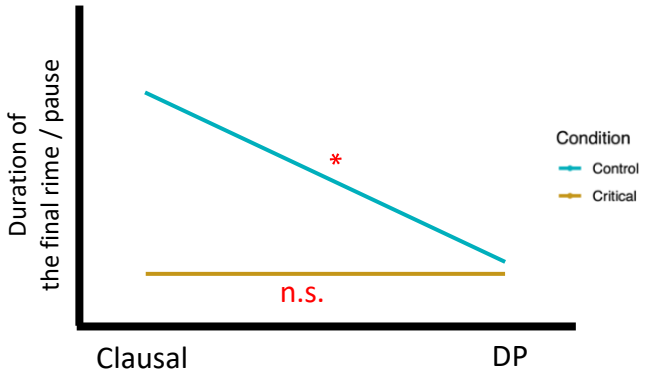


Figure 5: *Predicted data if elided material is not present in the prosodic structure.*

If there is a significant prosodic difference between coordination types within the Critical Condition, where the rime and the pause are both significantly longer for clausal coordination (10a) than for DP-coordination (10b), then we can further ask what is the reason for this difference by comparing it with the difference in the Control Condition. If the difference within the Critical Condition is comparable to (i.e., not significantly different from) that of the Control Condition (i.e., the slopes from the two conditions are not significantly different; parallel lines in Figure 6), then this is expected under the hypothesis that elided material is present prosodically because elided material could be surrounded by large prosodic boundaries, just like overt material.

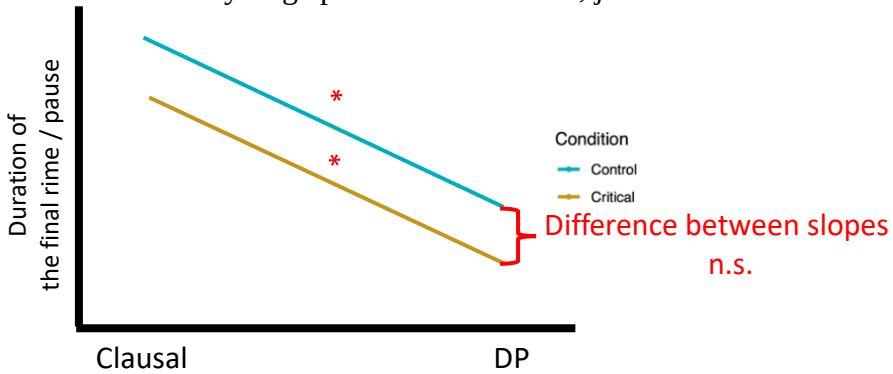


Figure 6: *Predicted data if elided material is present in the prosodic structure.*

We cannot directly compare the Critical Condition with the Control Condition (i.e., comparing (10a) with (10c); and (10b) with (10d)) because not only do they differ by whether there is ellipsis in the first conjunct, but they also have different lengths, differing in the numbers of overt syllables. Since phrase length can affect phrasing (e.g., Gee & Grosjean 1983; Jun 2000, 2003; Selkirk 2000; Watson & Gibson 2005), even if we find a significant prosodic difference, it may be due to a difference in syllable count, rather than ellipsis.

If we do find a significant prosodic difference between coordination types within the Critical Condition, but that difference is significantly smaller than the difference within the Control Condition (i.e., the slope of the Control Condition is significantly smaller than the slope of the Critical Condition; Figure 7), then it suggests a more nuanced picture: while elided material may be present in the prosodic structure, having ellipsis still neutralizes structural differences to some extent. For example, we could imagine that while elided material is mapped onto prosody, it might be mapped to "weaker" phonological phrases than overt material.

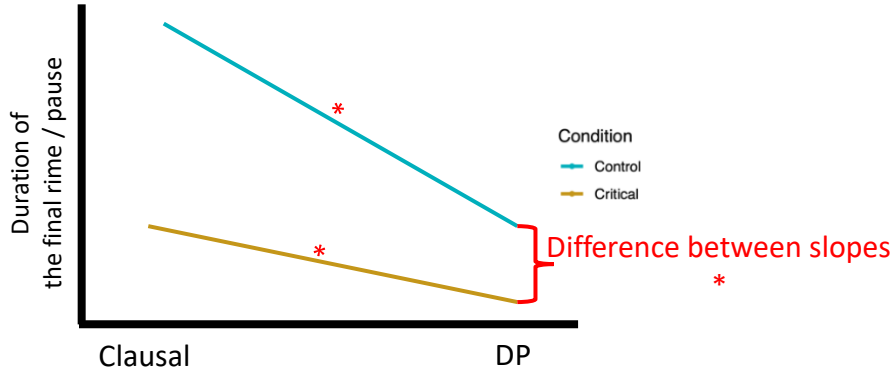


Figure 7: *Predicted data if elided material is mapped to weaker phonological phrases than overt material.*

3. Results

Within the Control Condition, the final rime before *and* is on average 77.4 ms longer in clausal coordination than in DP coordination ($p < 0.001$; Figure 8), and the pause before *and* is on average 101.8 ms longer in clausal coordination than in DP coordination ($p < 0.01$; Figure 9). This is expected and consistent with previous findings that different syntactic structures correspond to different prosodic realizations in coordination (e.g., Wagner 2005, 2010). These estimates of the magnitudes of difference, as well as all the other differences described in this section, are the coefficients of the fixed variables in the model.

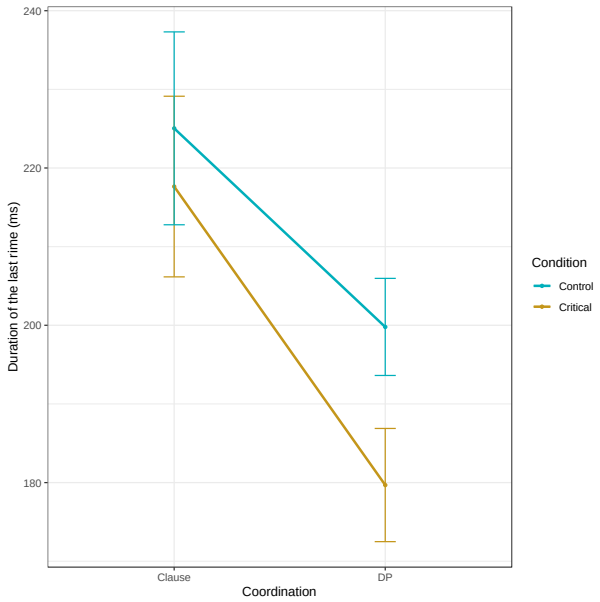


Figure 8: *Duration of the final rime before* and.

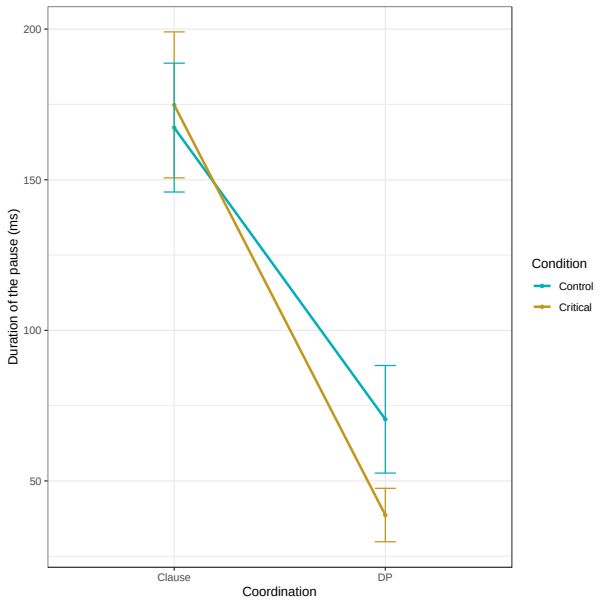


Figure 9: *Duration of the pause before* and.

Within the Critical Condition, the final rime before *and* is on average 55.8 ms longer in clausal coordination than in DP coordination ($p < 0.001$), and the pause before *and* is on average 146.9 ms longer in clausal coordination than in DP coordination ($p < 0.01$). This suggests that the prosodic boundary following that rime is larger in clausal coordination than in DP coordination, even though that difference has been obscured by ellipsis on the surface.

Finally, there is no significance in the interaction between coordination type and condition type–the differences in rime duration and pause duration within the Critical Condition are not significantly different from those within the Control Condition (i.e., no difference between differences), suggesting that the reason for the prosodic difference within the Critical Condition was underlying syntax. This is exactly the prediction if elided material is fully present in the prosodic structure.

Besides durations, I also want to mention a tendency that I observed and could be further investigated in future research: speakers sometimes contract *and* into *'n*, and they seem to be more likely to do so in (10b&d) than in (10a&c) (Figure 10). If *and*-contraction is more likely to occur when *and* is in a smaller / more embedded prosodic domain, this could potentially be another piece of evidence for the different prosodic structures of (10b&d) and (10a&c).

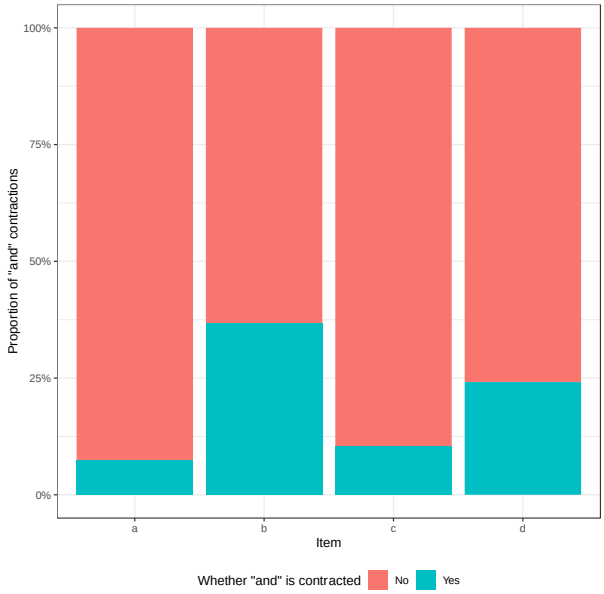


Figure 10: *Proportions of utterances that had* and *contraction and those that did not.*

I ran an ordinal logistic regression analysis with mixed effects whose dependent variable is binary– whether there is *and*-contraction, and whose fixed variables are coordination and condition, but did not find any statistical significance, both within each Condition and between the Conditions.

I suspect the reason for the lack of statistical significance may be that speakers do not often contract *and* in the sentences with DP-coordination to begin with, and therefore it may be difficult to detect a reduction in the rate of contraction for sentences with clausal coordination. My intuition is that speakers are less likely to contract *and* in the current experimental setting because they tend to speak more formally and slowly in this setting, and *and*-contraction may be less likely with formal and slow speech. It may be worth developing an experimental method that encourages speakers to produce more casual and faster speech, to see if there is significant difference in rate of *and*-contraction. I leave this question to future research.

4. Discussion

Within the Critical Condition, phonological phrases that contain elided material have larger boundaries than phonological phrases that do not contain any elided material, even though these phonological phrases have the same surface structure. Furthermore, the fact that there is no significant difference between differences (i.e., no significant difference between the difference in the Critical Condition and the difference in the Control Condition) suggests that the source of the prosodic difference within the Critical Condition comes from structural differences between clausal coordination and DP-coordination. This shows that prosody is sensitive to structural differences, whether or not the underlying structure contains elided material. This is expected if elided material is present in prosody.

5. Possible alternative explanations

Sentences (10a&c) and (10b&d) differ not only in coordination size, but also in two other factors: what I will call *focus* and *going-beyond-the-question*. Because the leading question is a *where-*

question for all of them, (10a&c) not only answer that question, but they go beyond the question by providing additional information on when she went to the restaurant. In contrast, (10b&d) only answer the *where*-question and nothing more. Also, because of the way the question-answer pair was set up, (10a&c) put double focus on *the restaurant* and *at midnight*, while (10b&d) put a single focus on *the restaurant and the giftshop*. Thus, we might interpret the experimental results differently, and say that they do not tell us anything about the prosodic effect of ellipsis because the results are completely due to the prosodic effect of focus or going-beyond-the-question. To be concrete, suppose the alternative hypotheses are (a) information that goes beyond the question is preceded by a stronger prosodic boundary than information that does not go beyond the question; and (b) focused material is surrounded by a stronger prosodic boundary than unfocused material.[6] This section will first discuss some conceptual challenges to these alternative hypotheses briefly, and then highlight two empirical challenges to them.

Conceptually, it is not obvious how to put the alternative hypotheses into theories. First, it is not trivial to define exactly what is going-beyond-the-question, and to argue that it is a feature with prosodic consequences. Focus has been argued in the literature to be a syntactic-semantic feature with prosodic correlates, but going-beyond-the-question has not. Here I suggest a possible way to theorize going-beyond-the-question.[7] According to Rooth (1992), focus association involves a squiggle operator that associates with a domain of focus. We may further assume that an answer to a question corresponds to a domain of focus. Assuming that an answer that goes beyond the question essentially responds to two questions, including an asked question and an unasked question, this answer thus contains two separate squiggle operators that associate with two separate domains of focus. In contrast, an answer that doesn't go beyond the question contains a single squiggle operator and a single domain of focus. The following subsections will present challenges to the going-beyond-the-question hypothesis, including this version of it.

It is also not trivial to spell out a theory of how information structure, such as going-beyond-the-question and focus, can affect prosodic structure, on top of the effects by syntax-prosody mapping, especially in a mapping theory that depends on levels of embedding.

Kratzer & Selkirk (2020) have made a proposal of how focus can affect prosodic structure. I discuss it briefly, and show that it cannot derive the experimental results here. Their analysis is based in the OT framework, and they proposed a family of constraints that require a focused constituent to be spelled out as the head (i.e., the most prominent sub-constituent) of an intonational phrase (ι) and the head of a phonological phrase (φ). We can imagine that if some of these constraints outrank Match Theory constraints, which require faithful mapping from syntax to prosody, then prosodic phrasing might deviate from syntactic constituency in order to ensure that focused material is the prosodic head.

The constraint that requires focus to be the head of a φ is trivially satisfied in (10a-d), and thus does not make a difference here. Therefore, I focus on the constraint that requires focus to be the head of an ι. Kratzer & Selkirk made an informal observation that in English, that constraint cannot alter ι-phrasing created by syntax-prosody mapping, and therefore should be outranked by mapping constraints. Appendix B confirms this observation with experimental results. Assuming that the constraint ranking for (10a-d) is the same as the ranking for Kratzer & Selkirk's sentences,

[6] A variant of the going-beyond-the-question hypothesis might also claim that there is a surprising effect created by the second conjunct *at midnight* because it may be surprising to go to the restaurant at midnight, and perhaps the speaker would pause before it to highlight the surprise. We could address this by replacing this adverb with a mundane one like *on Saturday*, and the prosodic differences are still present.

[7] I am grateful to Danny Fox for suggesting this to me.

this suggests that focus cannot alter ι-phrasing in (10a-d) either, contrary to what hypothesis (b) claims.

Having briefly discussed the potential challenges for putting the alternative hypotheses into theory, I will present the two empirical challenges to the alternative hypotheses in the next two subsections. First, they have difficulty accounting for the experimental results of this experiment. Second, they are excluded by additional data.

5.1. Empirical challenge 1 for the alternatives

To understand why the alternative hypotheses fail to account for the results of this experiment, let me spell them out more clearly. These alternative hypotheses posit that the effects found in this experiment are not due to the presence of silent structure in one sentence of the Critical Condition (10a) but absence of silent structure in the other sentence (10b). Whether there is ellipsis in (10a) does not matter to prosody because prosodic structure only depends on overt material, and elided material is ignored by the mapping process. The reason for the observed differences is the difference in going-beyond-the-question or focus.

While the alternative hypotheses may be able to account for the significant difference within the Critical Condition, they cannot account for the critical result here, which is the lack of difference between differences (i.e., lack of difference between the difference in the Critical Condition and that of the Control Condition).

It has already been demonstrated experimentally by Wagner (2005, 2010) that coordination size affects prosody: clausal coordination is mapped onto larger phonological phrases than DP-coordination. This effect is confirmed by this experiment, and realized as the significant difference within the Control Condition. Following the alternative hypotheses that prosody ignores silent structure, because on the surface, (10a&b) have the same coordination size, we should expect the prosodic effect due to coordination size to be zero in the Critical Condition, in contrast to a statistically significant effect in the Control Condition. Assuming that the prosodic effects due to going-beyond-the-question or focus for the Critical Condition are the same as the Control Condition, then the alternative hypotheses would predict a smaller prosodic difference within the Critical Condition than the difference within the Control Condition (i.e., Figure 7), contrary to the actual results of this experiment.

In order to account for the experimental results, the alternative hypotheses would need to say that the prosodic effects due to going-beyond-the-question or focus have somehow increased for the Critical Condition compared to the Control Condition, and the increase in those effects should equal to and offset the decrease in the prosodic effect by coordination size. It is not obvious why the prosodic effects by going-beyond-the-question or focus should differ for the Critical Condition. Even if they do differ, it is unlikely that the difference equals to the difference in the prosodic effect by coordination size.

5.2. Empirical challenge 2 for the alternatives: Follow-up experiment 1

Not only do the alternative hypotheses fail to account for the results of this experiment, but they also fail to account for results of a follow-up experiment. In this follow-up experiment, I made all the questions double *wh*-questions to address the objections raised by the alternative hypotheses.

	Critical Condition	**Control Condition**
Clausal coordination	(11a) Context: Loretta went on a road trip. Q: Where did Loretta go and when? A: McDonald's and on Sunday.	(11c) Context: Loretta went on a road trip. Q: Where did Loretta go and when? A: She went to McDonald's and on Sunday.
DP coordination	(11b) Context: Loretta went on a road trip. Q: Which restaurant and which giftshop did Loretta go to? A: McDonald's and Walt Disney.	(11d) Context: Loretta went on a road trip. Q: Which restaurant and which giftshop did Loretta go to? A: She went to McDonald's and Walt Disney.

Now all the target sentences just answer the question, and do not go beyond it.[8] Also, in the target sentences, each conjunct bears its own focus. Holding constant the question-answer relationship and the focus structure across conditions, if the results across conditions are the same as what we saw with the previous experiment (i.e., there is still a significant difference in the Critical Condition, and that difference does not differ significantly from the difference in the Control Condition), then we can attribute them to the effect of ellipsis (i.e., we can say that there is a significant difference in the Critical Condition because elided material is present in the prosodic structure; there is no difference between differences because the elided material is mapped onto the prosodic structure, just like overt material is).

5.2.1. Methods

I conducted a production study with five sets of items (which were modified version of the items in the previous experiment) and three native speakers. In addition to the four dialogs exemplified by (11a-d), each set consists of two other dialogs, which both involve broad focus in the target sentence. Those two dialogs were intended to test a separate question: does having broad focus vs. double focus affect the prosodic boundary? Because that question is not directly related to the question discussed in this section, I will delay the discussion of that question and the analysis to appendix B. All five sets of items, including the additional dialogs that involve broad focus, are presented in Section 8.

Recording took place in a sound-attenuated booth in the Linguistics Department of MIT. Participants were seated in front of a computer, which displayed one context-question-answer trio

[8] If we follow the way I theorized going-beyond-the-question at the beginning of this section, which is that it is really about involving two separate focus domains vs. a single one, we may wonder if (11a-d) all involve two separate focus domains. The question in (11b&d) may still be a single question that involves coordination of two *wh*-DPs, and asks what are the restaurant x and the giftshop y such that Loretta went to x and y. Then the answers in (11b&d) would only involve a single squiggle operator and a single focus domain. But if the question in (11b&d) can be a single question, nothing prevents the question in (11a&c) from being a single question as well. It can be a single question that involves coordination of two CPs, and asks what are the answers x and y to the questions that correspond to the two CPs. Thus, nothing in the theory of focus domains says that coordination of *wh*-DPs can involve a single focus domain, but coordination of larger phrases can't. There is no empirical evidence that suggests this is the case, either. Therefore, (11a-d) would fare the same in terms of going-beyond-the-question, all having the possibility of containing one or two focus domains.

at a time. The stimuli were presented in random order, so minimal pairs were not placed next to each other. Participants were given instructions about the task at the beginning of the experiment, and time to read quietly before reading out loud each trio. They were encouraged to act out the dialogues naturally rather than reading mechanically.

The method of data annotation and analysis was very similar to the method of the previous experiment. I labelled the last rime of the last word before *and* and the pause after that word, if there is a pause. Then I fitted two mixed effects models, with the duration of the last rime and the sum of the duration of the last rime and the duration of the pause as the dependent variable in each model, and coordination (clausal vs. DP) and condition (critical vs. control) as fixed effects. I calculated p-values using using Satterthwaite's degrees of freedom method. The models included random intercepts and slopes by speaker and item group where those effects didn't result in a singular fit. Initially I also ran a model with the pause duration as the dependent variable, but it always resulted in a singular fit, no matter how much I simplified the random effect structure, therefore I do not consider its results. Instead, I look at the sum of the rime duration and the pause duration. Because each duration is correlated with the strength of the boundary of interest, their sum should also be correlated.

5.2.2. Results

Within the Critical Condition, the final rime before *and* is on average 14.7 ms longer in clausal coordination than in DP coordination ($p < 0.01$; Figure 11), and the sum of the rime duration and the pause duration is on average 22.8 ms longer in clausal coordination than in DP coordination ($p < 0.05$; Figure 12). There is no significance in the interaction between coordination type and condition for either the duration of the rime or the sum of the rime duration and the pause duration.

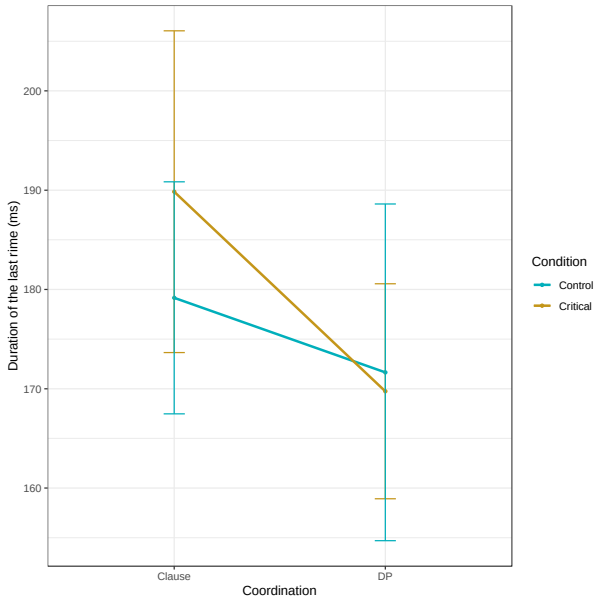


Figure 11: *Duration of the final rime before* and.

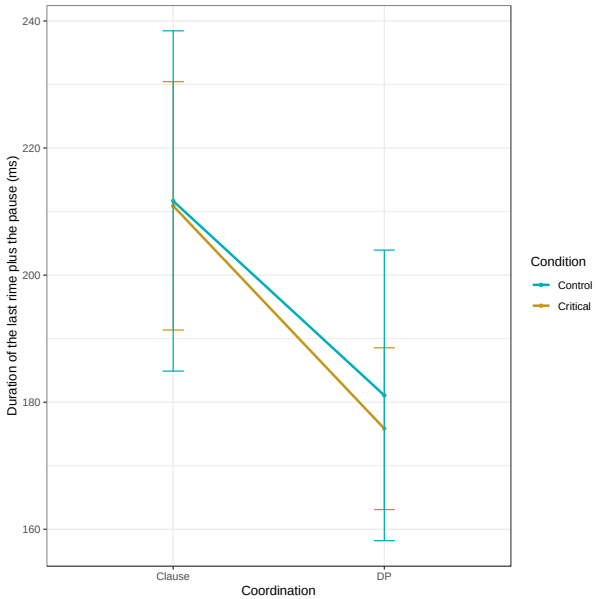


Figure 12: *Duration of the final rime plus the pause before* and.

5.2.3. Discussion

Holding constant the information structure across all conditions, there is still a significant prosodic difference within the Critical Condition, which suggests that the reason for this prosodic difference is the different underlying syntactic structures. This is further supported by the lack of interaction, which suggests that the different syntactic structures led to the different prosodic realizations in both the Critical Condition and the Control Condition. This is exactly the prediction if elided material is fully present in the prosodic structure just like overt material.

If the observed prosodic differences aren't just due to focus, can focus affect prosodic boundaries at all? Appendix B presents an experiment that searched for prosodic effects of focus on boundaries, but did not find any significant effect.

5.3. Empirical challenge 3 for the alternatives: Follow-up experiment 2

Materials like (10a-d) manipulate coordination size with DP+PP or DP+DP conjuncts, but they also create confounds, leading to the alternative hypotheses involving focus and going-beyond-the-question. We can try to control for these confounds with new examples that manipulate the coordination size in other ways, such as by using clausal adjuncts and DP-level adjuncts. Following is an example set using the clausal adjunct *too* and the DP-level adjunct *together*:[9]

(12) a. Q: Who did Lillian see?
A: She saw two people: Susan and Sally too.
b. Q: Who did Lillian set up to have dinner together?
A: Two of her best friends: Susan and Salina.
c. Q: Who did Lillian see?
A: She saw two people: She saw Susan and Sally too.
d. Q: Who did Lillian set up to have dinner together?
A: Two of her best friends: She set up Susan and Salina.

Impressionistically, the boundary following *Susan* is greater in (12a) than in (12b), and greater in (12c) than in (12d). (12a-d) do not go beyond the question, but they might still differ in focus structure systematically, with double focus in (12a&c) and a single broad focus on the entire conjunction in (12b&d). But (12a-d) can at least exclude the going-beyond-the-question hypothesis. To confirm this impression and try to exclude both alternative hypotheses, I conducted another follow-up experiment that was inspired by the use of clausal adjuncts in (12a-d).

5.3.1. Methods

Following is an example set of items from that experiment. The target sentences follow the same context and question.

[9] I am grateful to Michael Wagner for suggesting this set of sentences to me.

	Critical Condition	**Control Condition**
Clausal coordination	(13a) Context: The police are following Bill, one of the suspects on the case. Q: Where did Bill go? A: Certainly the campus and maybe the drugstore.	(13c) Context: The police are following Bill, one of the suspects on the case. Q: Where did Bill go? A: Certainly he went to the campus and maybe the drugstore.
DP coordination	(13b) Context: The police are following Bill, one of the suspects on the case. Q: Where did Bill go? A: The hospital campus and the corner drugstore.	(13d) Context: The police are following Bill, one of the suspects on the case. Q: Where did Bill go? A: He went to the hospital campus and the corner drugstore.

Collins (1988), Hirsch (2017) and others showed that sentential adverbs like *certainly* and *maybe* require a clausal coordination analysis. To control for length of the surface structure, I included nominal modifiers in (13b&d). (13a-d) do not go beyond the question, and they also have the same focus structure.

Because this experiment had a very similar setup to the main experiment and the first follow-up experiment, I only describe it briefly here. It involved 5 sets of items like (13a-d) and 20 participants. Section 8.3 presents all 5 sets of items. Because of the larger scale, annotation was done by Montreal Forced Aligner (McAuliffe et al. 2017) using acoustic models trained on LibriSpeech (Panayotov et al. 2015) rather than human annotators.

I fitted two linear mixed effects models, with the duration of the last rime, and the duration of that rime plus the pause after it as the dependent variable in each model, coordination (clausal vs. DP) and condition (critical vs. control) as fixed effects, and random intercepts and slopes by speaker and item group where those effects didn't result in a singular fit.

5.3.2. Results

Within the Critical Condition, the final rime before *and* is on average 8.5 ms longer in clausal coordination than in DP coordination ($p < 0.05$; Figure 13); the sum of the rime duration and the pause duration does not differ significantly between clausal coordination and DP coordination (Figure 14). There is also no significant difference in the sum duration of the rime plus the pause within the Control Condition. There is no significance in the interaction between coordination type and condition for either the duration of the rime or the sum of the rime and the pause duration.

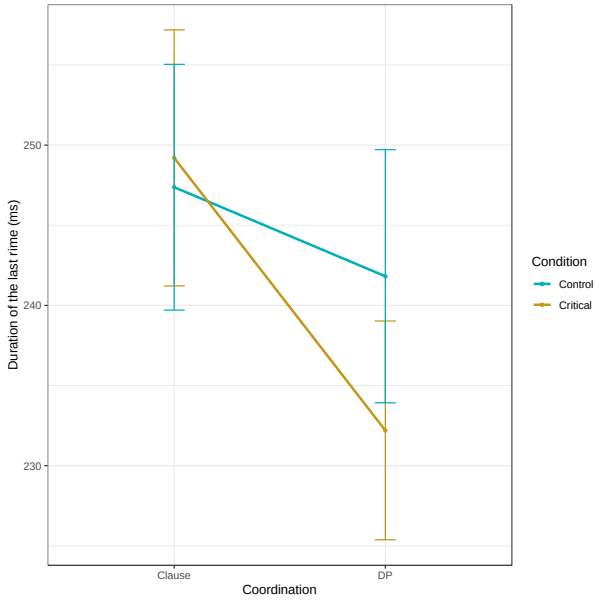


Figure 13: *Duration of the final rime before* and.

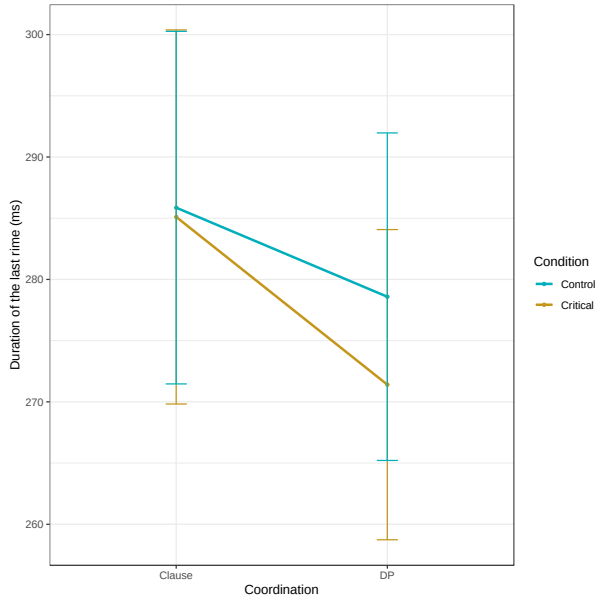


Figure 14: *Duration of the final rime plus the pause before* and.

5.3.3. Discussion

Holding constant the information structure across all conditions by using clausal and nominal adjuncts, there is still a significant prosodic difference in rime duration within the Critical Condition, but there is no interaction. This suggests that the prosodic boundary following the first conjunct varies according to the underlying syntactic structure, even when that syntactic structure contains elided material.

However, there is no significance in any comparison of the duration of the rime plus the pause, even within the Control Condition. This is surprising if we follow the analysis that clausal adverbs require a clausal coordination analysis. We would expect the syntactic difference between clausal and DP coordination to be reflected by prosody at least in the Control Condition.

I provide my speculation as to why the result did not turn out as expected. Impressionistically, in sentences with clausal adverbs, speakers often paused after *and* instead of before *and*. This behavior recurs in a separate experiment that studies corrective *but* sentences with clausal adverbs (see section 3 of chapter 6). I leave to future research exactly why the presence of clausal adverbs makes speakers pause differently, but I just want to point out that this factor could be responsible for the lack of effect in Critical and Control Conditions. If speakers pause less often before *and* with clausal adverbs than in sentences without clausal adverbs, then we would expect the average pause to be shorter in sentences with clausal adverbs than in those with the same structure, but without clausal adverbs. Maybe the pause in (13a&c) is shortened because of this, which makes it not much longer than the pause in (13b&d), thus leading to the lack of effect in both Critical and Control Conditions.

6. Comparison with other theories of syntax-prosody mapping

There are many different theories on syntax-prosody mapping. For our purposes, I divide them into two categories: (a) those that claim that the prosodic structure can replicate the dominance

relations in the syntactic structure (e.g., by recursive prosodic structure), and (b) those that don't necessarily say so, but instead stipulate that a syntactic clause should correspond to a stronger prosodic phrase than a subclause. I have adopted Elfner's version of Match Theory, which belongs to the first category. This section discusses another theory in the first category–Wagner's (2010) embedding-based mapping–and a theory in the second category–edge-based theory (Selkirk 1986, 1995 and others).

Wagner's theory of embedding-based mapping is equivalent to Match Theory plus the auxiliary assumption, but this is only for the empirical phenomena discussed in this chapter; I will discuss some potential differences in other phenomena that could be tested.

Edge-based theory (or any theory in the second type) can actually account for the experimental results but not tell us anything about the research question at all because it can derive the experimental results regardless of whether elided material has prosodic representation. I did not adopt the second type of theories for two reasons. First, in order to account for the experimental results, the second type of theories crucially requires a CP and a TP to correspond to the same prosodic domain. But appendix C presents independent evidence that suggests the contrary: a CP and a TP may correspond to different prosodic phrases, even though they are both considered to be clausal. The second argument against the second type of theories is based on simplicity: if we allow prosodic structure to be recursive, there may not be need for a clause to correspond to a separate prosodic category.

6.1. Embedding-based mapping

Wagner (2010) proposed that constituents that are more deeply embedded are separated from each other by weaker prosodic boundaries than constituents that are less deeply embedded. Assuming that stronger prosodic boundaries are associated with more domain-final lengthening, this can account for the prosodic contrast within the Control Condition. *Restaurant* is more deeply embedded in (10d) than in (10c), and therefore it is followed by a weaker prosodic boundary in (10d) than in (10c). The significant difference within the Critical Condition and the lack of difference between differences suggest that elided material has prosodic representation. If elided material is present in the prosodic structure, then *restaurant* is more deeply embedded in (10b) than in (10a), and therefore has less domain-final lengthening in in (10b) than in (10a).

Wagner's theory was meant to capture precisely the gradient durational effects in coordination by referring to the relative strength of prosodic boundaries. It therefore does not require the auxiliary assumption that Match Theory requires. For the purposes of this chapter, Wagner's theory is equivalent to Match Theory plus the auxiliary assumption.

But Wagner (2010) and Match Theory make different predictions in other areas, which I briefly describe here and leave to future research. An important difference between Match Theory and Wagner's theory is that the former distinguishes between different labels (φ, ω and possibly ι (intonational phrase)), while the latter does not need to assign labels to the prosodic levels. Therefore, one place where Match Theory and Wagner's theory may diverge is whether gradient effects always occur across labels. Match Theory predicts that some gradient effects may be limited to just one label (say φ, but not ω), but Wagner's theory does not necessarily predict this. Furthermore, Match Theory predicts that an effect that only occurs to φs should only care about the number of φ-levels within a φ, but not say, the number of ω-levels within a φ. If there are prosodic phenomena of this sort, they would be arguments for assigning labels to prosodic levels.

6.2. Edge-based theory

Edge-based theory can account for the experimental results here, but does not tell us whether elided material has prosodic representation. Edge-based theory aligns edges of syntactic constituents to edges of prosodic constituents.[10] Specifically, edges of syntactic clauses (roughly TP or CP) correspond to edges of intonational phrases (ι), and edges of syntactic subclauses (anything smaller than a TP, e.g., a DP) correspond to phonological phrases (φ).

Let us assume that in English coordination, the right edge of an NP corresponds to the right edge of a φ,[11] and the right edge of a TP or CP corresponds to the right edge of an ι. Left edges are inserted to the prosodic structure to close constituents with only the right edge. This gives us the following prosodic structures for the sentences in the Control Condition (10c-d):

(14) *Prosodic structure of (10c)*
$_{\iota}$($_{\varphi}$(She went to the restaurant)) $_{\iota}$($_{\varphi}$(and at midnight))

(15) *Prosodic structure of (10d)*
$_{\iota}$($_{\varphi}$(She went to the restaurant) $_{\varphi}$(and the giftshop))

In (10c), *restaurant* is at the right edge of the φ that corresponds to the right edge of the NP *restaurant*, and also the ι that corresponds to the first clause. In (10d), *restaurant* is at the right edge of just a φ. Assuming that the last rime in an ι undergoes more lengthening than the last rime in a φ, this can account for the durational difference within the Control Condition.

Edge-based theory can also account for the significant prosodic difference within the Critical Condition (10a&b), and the lack of difference between differences. But it does not tell us if elided material is represented prosodically because even if it is not, edge-based theory can still derive the results correctly. First, I repeat the syntactic analyses of (10a-b) below:

(16) *Syntactic analysis of (10a)*
[$_{CP}$ [The restaurant]$_{i}$ ~~she went to t$_{i}$~~] and [$_{CP}$ [at midnight]$_{i}$ ~~she went there t$_{i}$~~].

(17) *Syntactic analysis of (10b)*
[$_{CP}$ [The restaurant and the giftshop]$_{i}$ ~~she went to t$_{i}$~~].

Following are the prosodic structures of (10a-b) assigned by edge-based theory, aligning NP and CP boundaries to φ- and ι-boundaries respectively:

[10] There have been different versions of edge-based theory. Originally, Selkirk (1986) suggested that languages differ in which edge of syntactic constituents correspond to the edge of prosodic constituents, and this cross-linguistic difference is due to parameter settings. For example, ChiMwiini aligns the right edge of syntactic phrases, but not the left edge. Selkirk (1995) then developed this into an OT analysis using violable alignment constraints. Truckenbrodt (1995, 1999) built on Selkirk's OT analysis, and added an additional constraint Wrap, which requires syntactic phrases to be contained in phonological phrases. These versions of edge-based theory do not make a difference here. Therefore, for simplicity I follow the original approach based on parameter settings.

[11] It is possible that other syntactic subclauses (e.g., a VP) may also be aligned to φ, but they do not matter to us here because our focus is the right boundary after *restaurant*, and it is already followed by the φ boundary that corresponds to the NP.

(18) *Prosodic structure of (10a)*
ι(φ(The restaurant)) ι(φ(and at midnight))

(19) *Prosodic structure of (10b)*
ι(φ(The restaurant) φ(and the giftshop))

Note that whether elided material has prosodic representation does not matter here. In (16), *the restaurant* moves out of the ellipsis site to Spec, CP. In (17), the entire DP-conjunction also moves to Spec, CP, but *the restaurant* is embedded inside this DP-conjunction. These CPs are aligned to ι, and it does not matter whether these CPs contain elided material, or whether that elided material has prosodic representation. These prosodic structures give us the effect that the last rime of *restaurant* is longer in (10a) than (10b) because it is final in an ι in (10a) but final in a φ in (10b). Therefore, edge-based theory can derive the experimental results, whether or not elided material has prosodic representation.

So far, I have shown that edge-based theory can derive the experimental results, regardless of the syntactic analysis of fragment answers, and regardless of whether elided material has prosodic representation. It can do so because it aligns a clause differently from a subclause. The discussion in this subsection applies to any theory of syntax-prosody mapping that distinguishes between clauses and subclauses, including versions of Match Theory that do so (see footnote 1). I will now discuss two potential challenges to these theories.

6.2.1. Challenge 1: TP and CP may correspond to different prosodic domains

A crucial assumption in edge-based theory's account of the experimental results in this chapter is that a TP-edge and a CP-edge are both aligned to the same prosodic category–ι. This is because in the Control Condition, there is no syntactic movement, and therefore in the clausal-coordination sentence (10c), *restaurant* is at a TP-edge. But in the clausal-coordination sentence of the Critical Condition (10a), *the restaurant* has undergone syntactic movement to Spec, CP (assuming that ellipsis requires movement), and therefore *restaurant* is at a CP-edge. If the TP-edge and the CP-edge correspond to different prosodic boundaries, we would expect the prosodic boundary in (10a) to be greater than the boundary in (10c), and therefore, a larger prosodic difference in the Critical Condition than the Control Condition, contrary to the finding here. Experimental evidence in appendix C suggests that not only can φs be recursive, but ιs can as well. This would mean that a CP containing a TP may correspond to a larger prosodic domain than just a TP, contrary to the crucial assumption required by edge-based theory.

6.2.2. Challenge 2: Simplicity of a theory that does not distinguish between φ and ι

Evidence from chapter 6 and appendix C suggests that in English coordination at least, syntax-prosody mapping makes finer-grained distinctions than the φ-vs.-ι distinction that edge-based theory claimed it makes, and distinguishes between various φs and between various ιs. A simpler theory could get rid of the φ-vs.-ι distinction altogether, and only refer to levels of embedding. According to this theory, what used to be ι could just be a φ that dominates another φ, therefore it is stronger than a φ that does not dominate any φ. Until we find independent evidence suggesting the presence of a separate ι-category, we should adopt the simpler theory that does not assume a separate ι-category.

6.2.3. Future work on ellipsis in subclauses

The reason why the experimental results in this chapter may not tell us if elided material has prosodic representation is that the experimental materials either involve clausal coordination or DP-coordination, and there are prosodic theories that would assign these two types of coordination to different prosodic labels. While some prosodic theories assume that syntactic clauses and subclauses should correspond to different prosodic labels, no theory to my knowledge has made this assumption about different subclauses. For example, no theory has claimed that a vP should correspond to a different prosodic label from a DP. Thus, we could test the research question in this chapter with materials that involve vP-coordination and DP-coordination. I leave this to future research.

7. Conclusion

This chapter presented an experiment that suggests that elided material affects prosody, despite being silent. Specifically, elided material is mapped onto the prosodic structure, and surrounded by prosodic boundaries just like pronounced material. These results crucially rely on the following assumption: a syntactic clause corresponds to a stronger prosodic phrase than a subclause that it contains, not because syntactic clauses correspond to a special prosodic category, but because the strength of prosodic phrases tracks their levels of embedding in syntax.

Following a derivational view of the syntax-prosody mapping, the experimental results suggest that elided material must be present in the syntactic structure to begin with. Deletion of this material takes place after the creation of prosodic boundaries, so that at the point of prosodification, elided material is present.

If previous findings were correct that other silent material does not have prosodic representation (e.g., Chen 1987; Lin 1994; Truckenbrodt 1999), then my result here suggests a dichotomy of silence, with elided material having prosodic representation on the one hand, and null heads and their projections (and perhaps traces) not having prosodic representation on the other.

This is compatible with a particular ordering of derivations in the syntax-morphology-prosody branch of the generative model. Suppose that prosodic structure is created at one point of the derivations (I call this process *prosodification*), and cannot be modified at a later derivation. Then my findings are compatible with the following order of operations: Vocabulary Insertion precedes prosodification, which then precedes deletion of elided material, so that prosody knows which heads are silent and should be ignored, and at the point of prosodification, elided material has not been fully deleted yet.

If elided material is mapped onto the prosodic structure, then it also has consequences for our understanding of prosodic structure and its phonological and phonetic realization. The experimental results in this chapter suggest that Figure 3 is the correct prosodic representation of the sentence containing ellipsis (2). This structure is very unusual in that it has nodes that dominate only silent material. A consequence of this is that there can be prosodic domains that only contain silent material. I leave to future research exactly how to interpret Figure 3, but I point out some questions and possible answers.

Consider the φ that immediately dominates the silent words *went to* in Figure 3. If this is a φ just like normal φ, does it have boundary effects such as pre-boundary lengthening and boundary tone? If so, what gets lengthened, and where is the boundary tone realized? Does this φ have a

head? If so, how is prosodic prominence that is normally realized on overt material (e.g., stress and pitch accents in English, pitch range expansion in other languages) realized on this silent head?

These questions–whether silent φs have boundary and prominence effects–are empirical questions. It may be difficult to search for phonological phenomena in silent material, but we could look for indirect evidence. For example, in languages that normally realize prominence as stress, and in addition have a ban on stress clash, we could detect stress in elided material if it can cause a stress clash.

Whether or not silent φs exist and have phrasing- and prominence-related phenomena, these findings will be significant for our understanding of prosody. If silent φs can have phrasing- and prominence-related phenomena, then this suggests that all φs have these phenomena, whether they contain overt or silent material. This would require a new understanding of exactly what are phonological and phonetic phenomena, if they do not have overt realization. On the other hand, if silent φs do not have these phenomena, then this suggests that there are φs that count as a level of φ in the prosodic structure, but do not have any phonological phenomenon normally associated with a φ. We can nevertheless detect these silent φs by levels of embedding–φs that dominate these φs are stronger domains and have stronger phonetic effects than those that do not dominate these φs.

8. Experimental items

This section presents the entire sets of experimental items for the main experiment and the two follow-up experiments.

8.1. Main experiment

There were five sets, each set containing four context-question-answer trios. The four trios in each set have the same context and question, which I do not repeat here, but the complete trio was presented to the speakers. The (a) items involve ellipsis in the first conjunct and clausal coordination; the (b) items involve ellipsis in the first conjunct and DP coordination; the (c) items involve no ellipsis in the first conjunct and clausal coordination; the (d) items involve no ellipsis in the first conjunct and DP coordination.

(20) Context: It was John's first time at a Chinese restaurant.
Question: What did John eat?
Answer:
a. The lettuce and with chopsticks.
b. The lettuce and the bacon.
c. He ate the lettuce and with chopsticks.
d. He ate the lettuce and the bacon.

(21) Context: Bill has been acting weird lately.
Question: Where did Bill go?
Answer:
a. The nightclub and on Tuesday.
b. The nightclub and the drugstore.
c. He went to the nightclub and on Tuesday.
d. He went to the nightclub and the drugstore.

(22) Context: Anne has been into reading lately.
Question: What did Anne read?
Answer: a. To Kill a Mockingbird and in one sitting.
b. To Kill a Mockingbird and The Great Gatsby.
c. She read To Kill a Mockingbird and in one sitting.
d. She read To Kill a Mockingbird and The Great Gatsby.

(23) Context: Aaron has been going on a shopping spree.
Question: What did Aaron buy?
Answer: a. A handbag and in London.
b. A handbag and a dress shirt.
c. He bought a handbag and in London.
d. He bought a handbag and a dress shirt.

(24) Context: Loretta has disappeared.
Question: Where did Loretta go?
Answer: a. The restaurant and at midnight.
e. The restaurant and the gift shop.
f. She went to the restaurant and at midnight.
g. She went to the restaurant and the gift shop.

8.2. Follow-up experiment 1

There were five sets, each set containing six context-question-answer trios. The six trios in each set have the same context, which I do not repeat here, but the complete trio was presented to the speakers. The (a) items involve double focus, ellipsis in the first conjunct and clausal coordination; the (b) items involve double focus, ellipsis in the first conjunct and DP coordination; the (c) items involve double focus, no ellipsis in the first conjunct and clausal coordination; the (d) items involve double focus, no ellipsis in the first conjunct and DP coordination; the (e) items involve broad focus, ellipsis in the first conjunct and DP coordination; the (f) items involve broad focus, no ellipsis in the first conjunct and DP coordination.

(25) Context: John went to a diner.
a. Question: What did John eat and how?
Answer: The lettuce and with a fork.
b. Question: Which vegetable and which meat did John eat?
Answer: The lettuce and the bacon.
c. Question: What did John eat and how?
Answer: He ate the lettuce and with a fork.
d. Question: Which vegetable and which meat did John eat?
Answer: He ate the lettuce and the bacon.
e. Question: What did John eat?
Answer: The lettuce and the bacon.
f. Question: What did John eat?
Answer: He ate the lettuce and the bacon.

(26) Context: Bill went to Boston last week.
   a. Question: Where did Bill go and when?
      Answer: The Public Garden and on Tuesday.
   b. Question: Which park and which museum did Bill go to?
      Answer: The Public Garden and the MFA.
   c. Question: Where did Bill go and when?
      Answer: He went to the Public Garden and on Tuesday.
   d. Question: Which park and which museum did Bill go to?
      Answer: He went to the Public Garden and the MFA.
   e. Question: Where did Bill go?
      Answer: The Public Garden and the MFA.
   f. Question: Where did Bill go?
      Answer: He went to the Public Garden and the MFA.

(27) Context: Anne went to the library.
   a. Question: What did Anne read and for how long?
      Answer: Pride and Prejudice and for two hours.
   b. Question: Which fiction and which non-fiction did Anne read?
      Answer: Pride and Prejudice and The Righteous Mind.
   c. Question: What did Anne read and for how long?
      Answer: She read Pride and Prejudice and for two hours.
   d. Question: Which fiction and which non-fiction did Anne read?
      Answer: She read Pride and Prejudice and The Righteous Mind.
   e. Question: What did Anne read?
      Answer: Pride and Prejudice and The Righteous Mind.
   f. Question: What did Anne read?
      Answer: She read Pride and Prejudice and The Righteous Mind.

(28) Context: Aaron went on a shopping trip.
   a. Question: What did Aaron buy and where?
      Answer: A turtleneck and in London.
   b. Question: Which top and which bottoms did Aaron buy?
      Answer: A turtleneck and denim shorts.
   c. Question: What did Aaron buy and where?
      Answer: He bought a turtleneck and in London.
   d. Question: Which top and which bottoms did Aaron buy?
      Answer: He bought a turtleneck and denim shorts.
   e. Question: What did Aaron buy?
      Answer: A turtleneck and denim shorts.
   f. Question: What did Aaron buy?
      Answer: He bought a turtleneck and denim shorts.

(29) Context: Loretta went on a road trip.
a. Question: Where did Loretta go and when?
Answer: McDonald's and on Sunday.
b. Question: Which restaurant and which giftshop did Loretta go to?
Answer: McDonald's and Walt Disney.
c. Question: Where did Loretta go and when?
Answer: She went to McDonald's and on Sunday.
d. Question: Which restaurant and which giftshop did Loretta go to?
Answer: She went to McDonald's and Walt Disney.
e. Question: Where did Loretta go?
Answer: McDonald's and Walt Disney.
f. Question: Where did Loretta go?
Answer: She went to McDonald's and Walt Disney.

8.3. Follow-up experiment 2

There were five sets, each set containing four context-question-answer trios. The four trios in each set have the same context and question, which I do not repeat here, but the complete trio was presented to the speakers.

(30) Context: They are monitoring John's diet.
Question: What did John eat?
a. Answer: Probably the lettuce and possibly the bacon.
b. Answer: The Mexican lettuce and the Italian bacon.
c. Answer: Probably he ate the lettuce and possibly the bacon.
d. Answer: He ate the Mexican lettuce and the Italian bacon.

(31) Context: The police are following Bill, one of the suspects on the case.
Question: Where did Bill go?
a. Answer: Certainly the campus and maybe the drugstore.
b. Answer: The hospital campus and the corner drugstore.
c. Answer: Certainly he went to the campus and maybe the drugstore.
d. Answer: He went to the hospital campus and the corner drugstore.

(32) Context: They are monitoring what Anne reads because it gives a clue about what she likes.
Question: What did Anne read?
a. Answer: Definitely the newspapers and perhaps the comics.
b. Answer: The Massachusetts newspapers and the New York comics.
c. Answer: Definitely she read the newspapers and perhaps the comics.
d. Answer: She read the Massachusetts newspapers and the New York comics.

(33) Context: Aaron spent a lot of money recently, and they are trying to find out what he spent on.
Question: What did Aaron buy?
a. Answer: Evidently a handbag and regrettably a diamond.
b. Answer: A Filipino handbag and a South African diamond.
c. Answer: Evidently he bought a handbag and regrettably a diamond.
d. Answer: He bought a Filipino handbag and a South African diamond.

(34) Context: Loretta disappeared, and the detective is trying to find out where she was last seen.
Question: Where did Loretta go?
a. Answer: Apparently the train station and allegedly the gift shop.
b. Answer: The East Newburyport station and the Pakistani gift shop.
c. Answer: Apparently she went to the train station and allegedly the gift shop.
d. Answer: She went to the East Newburyport station and the Pakistani gift shop.

Chapter 6
Prosody of corrective *but* sentences

1. Introduction

Chapter 5 has showed that ellipsis affects prosody, and that we can find prosodic evidence of elided material. If this is the case, can we in turn use prosodic evidence to probe if there is elided material in the syntactic structure? Because elided material has no phonological content, ellipsis may be difficult to detect using diagnostics such as word order. If prosody can offer a diagnostic of ellipsis, then it may be useful if other diagnostics are not so clear. This chapter presents an experiment as proof of concept that prosodic evidence can indeed diagnose ellipsis.

Since it is a relatively new domain to provide prosodic arguments for syntax, it would be good to start in a terrain where we have independent reason to lean towards a particular syntactic analysis. Chapter 4 has argued using syntactic-semantic diagnostics such as constituency tests and antecedent-contained deletion that there can be ellipsis in some corrective *but* sentences. This makes these sentences an ideal place to run this kind of experiment: given the strong arguments from syntax-semantics, we might have a clear inclination of how the prosodic experiment should turn out. Therefore, I see this work as a proof of concept–that is, prosodic data *can* bear on syntactic questions, leading to a new and reliable source of argument for syntactic research more generally.

This experiment not only shows that prosodic evidence can shed light on syntactic theories, but it also demonstrates that syntactic theory can in turn provide a basis for investigating questions about the mapping process between syntax and prosody. To this end, I will focus on corrective *but* sentences for which the syntactic analysis is less controversial and broadly agreed-on. Once we assume this syntactic analysis, these corrective *but* sentences provide a great place to study important theoretical questions about the syntax-prosody mapping that are otherwise difficult to study due to confounds that arise in other environments.

Therefore, this experiment tries to answer two separate research questions: (a) what the correct syntactic analysis of some corrective *but* sentences is (i.e., making syntactic arguments using prosodic evidence); and (b) what sorts of syntactic phrases are mapped onto the prosodic structure. This experiment (and also the experiment in chapter 5) takes advantage of an empirical generalization about English coordination that has been confirmed experimentally (e.g., Wagner 2005, 2010, and confirmed again by the experimental results in chapter 5): in coordination, the size of the coordinated constituents is correlated with their prosody. For example, (1a) is a coordination of two TPs, while (1b) can involve coordination of two DPs.

(1) a. [$_{TP}$ Lillian will look for Lauren] or [$_{TP}$ she will look for Bella].
b. Lillian will look for [$_{DP}$ Lauren] or [$_{DP}$ Bella] this Saturday.

This difference in syntactic structure is reflected in their prosody: *Lauren* in (1a) is followed by a larger prosodic boundary than *Lauren* in (1b). The experiment in this chapter uses this empirical observation to adjudicate between two competing syntactic approaches to corrective *but* sentences like (2). Corrective *but* sentences derive their name from one of their uses–to correct someone (e.g., (2a) or (2b) can correct someone who says *Max has been on an all-meat diet, and therefore he misses spinach*), but correction is not their only use. They require presence of negation in the first conjunct and absence of negation in the second conjunct. Absence or presence of negation in both conjuncts is not possible (3)–(4).

(2) a. Max does**n't** miss spinach but chard.
b. Max misses **not** spinach but chard.
(Based on Toosarvandani 2013:828)

(3) #Max misses spinach but chard.

(4) #Max does**n't** miss spinach but **not** chard.

1.1. Competing syntactic analyses of (2b) and their prosodic predictions

In chapter 4, I provided a syntactic analysis of (2a-b), and contrasted it with the previous analysis in the literature by Toosarvandani (2013). Toosarvandani and I agree on the analysis of (2a), but differ on (2b). I will now present my syntactic analysis and Toosarvandani's, and show that prosody can adjudicate between these two analyses of (2b). Furthermore, following the analysis of (2a) that we agree on, (2a) can actually provide a good place to study the question of syntax-prosody mapping.

Toosarvandani analyzed (2b) as DP-coordination ((5), I call this *the strictly-DP-coordination approach*, to be contrasted with the second approach).

(5) *Analysis of (2b) according to the strictly-DP-coordination approach*
Max misses [$_{DP}$ **not** spinach] but [$_{DP}$ chard].

In chapter 4, I provided evidence based on syntax-semantics that suggests that (2b) actually has more than one possible parse (I call this *the ambiguity approach*). One of these parses involves DP-coordination (6a), but the other parses could involve larger coordination (e.g., vP-coordination, (6b), and TP-coordination (6c)) plus ellipsis.

(6) *Multiple analyses of (2b) according to the ambiguity approach*
a. Max misses [$_{DP}$ **not** spinach] but [$_{DP}$ chard].
b. Max [$_{vP}$ misses **not** spinach] but [$_{vP}$ chard$_i$ ~~misses t$_i$~~].
c. [$_{TP}$ Max misses **not** spinach] but [$_{TP}$ chard$_i$ ~~he misses t$_i$~~].

Following the empirical observation that size of coordination affects prosody, these two approaches make different predictions about the prosody of (2b). The strictly-DP-coordination approach predicts that (2b) should have the prosody of DP-coordination. We can test this prediction by comparing the prosody of (2b) with that of a sentence that is uncontroversially DP-coordination, such as (7). The strictly-DP-coordination expects the prosodic boundary in (2b) to be no different from the boundary in (7) (Figure 1).

(7) Max doesn't mix spinach and chard.

In contrast, the ambiguity approach claims that (2b) can involve vP- and TP-coordination. Suppose that in speech production, the speaker will choose any one of these parses when saying it. This means that the speaker will sometimes produce (2b) as DP-coordination, sometimes as vP-coordination and other times as TP-coordination. Based on previous findings that coordinated TP has a larger prosodic boundary than coordinated DP, if we can look at many speakers' many

productions of (2b), and can take an "average" of their prosodic realizations across these many instances of production, then the ambiguity approach predicts that on average, the prosodic boundary in (2b) should be larger than that of (7) (Figure 2).

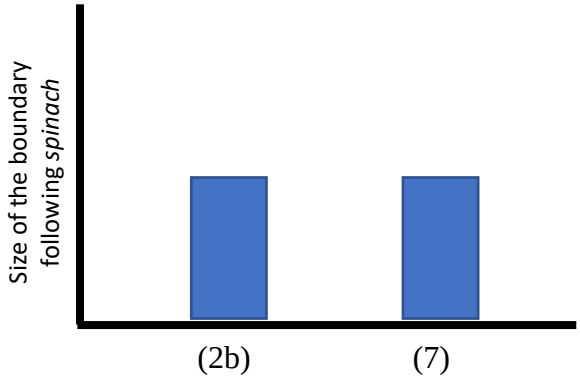


Figure 1: *Prediction of the strictly-DP approach.*

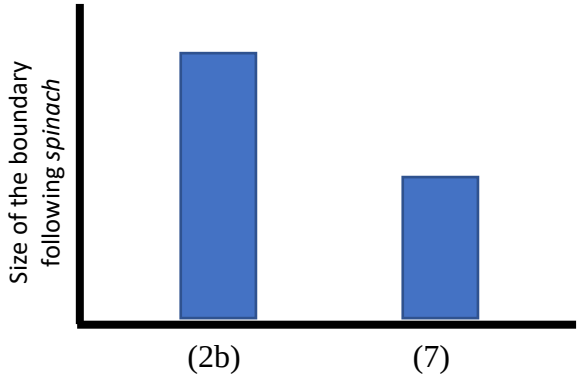


Figure 2: *Prediction of the ambiguity approach.*

1.2. Competing theories of syntax-prosody mapping and their prosodic predictions

Having discussed the competing syntactic analyses of (2b), I will now discuss the analysis of (2a) that we agree on, and argue that this syntactic analysis can in turn shed light on syntax-prosody mapping. We agree that (2a) should be analyzed as vP-coordination (8).

(8) *The analysis of (2a) according to both approaches*
Max does [$_{vP}$ not miss spinach] but [$_{vP}$ chard$_i$ ~~miss t$_i$~~].

It has not been studied before to my knowledge how a syntactic structure like (8) is mapped onto prosody. Specifically, it is not clear how in English, a vP that contains a DP is mapped onto prosody. This is the second research question that this experiment wants to address (i.e., what sorts of syntactic phrases are mapped onto prosody).

Different theories on syntax-prosody mapping make different predictions about this question. They fall into two types: one that follows the Strict Layer Hypothesis (Nespor & Vogel (1986); Selkirk (1986); Pierrehumbert and Beckman (1988)), where the prosodic structure is flatter than the syntactic structure and does not have nested structure, and the other where the prosodic structure can replicate the dominance relations in the syntactic structure. The first type of theories would neutralize the difference between a vP that contains a DP and a syntactic phrase that doesn't dominate any other phrase, and map the dominating phrase and the non-dominating phrase to prosodic constituents of the same strength. The second type would look at the fact that the vP contains a DP, and map the vP to a stronger prosodic constituent than a syntactic phrase that doesn't dominate any other phrase.

For concreteness, here I discuss an example theory that belongs to the first type (i.e., edge-based theory (Selkirk 1986, 1995 and others)), and two theories that belong to the second type (i.e., Match Theory (Selkirk 2009, 2011; Elfner 2012, 2015; Bennett et al. 2016; Ito & Mester 2013,

2015 and others), and embedding-based mapping (Wagner 2010)). I will also discuss how the prosody of (8) can adjudicate between these two types of theories.

Edge-based theory aligns edges of syntactic subclauses (i.e., DP and vP in our case) and clauses (i.e., TP) to edges of prosodic constituents. Assuming that English aligns the right edge of DP and vP to the right edge of a phonological phrase (φ), and the right edge of TP to the right edge of an intonational phrase (ι), *spinach* in (8) would be followed by a φ-boundary (9) because it is at the right edge of a DP and a vP. Furthermore, Selkirk's version (1986) of edge-based theory does not allow recursive prosodic structure (e.g., a φ cannot dominate another φ).[1] Although the right edge of the vP (*miss spinach*) coincides with the right edge of the DP (*spinach*), there is only a single φ-boundary. This shows that edge-based theory can lead to a flatter prosodic structure than the syntactic structure.

(9) *Prosodic structure of (8) assigned by edge-based theory*
Max doesn't miss spinach)$_{φ}$ but chard.

Contrast edge-based theory with Match Theory, which matches syntactic phrases to φ,[2] and allows recursive prosodic structure. In the prosodic structure that Match Theory assigns to (8), *spinach* is at the right edge of two φs: one which is mapped from the DP *spinach*, and the other which is mapped from the vP *miss spinach*.

(10) *Prosodic structure of (8) assigned by the Elfner's Match Theory*
Max doesn't miss spinach)$_{φ}$)$_{φ}$ but chard.

Wagner's theory differs from Match Theory in not referring to a separate prosodic structure that consists of φs, but it allows recursive prosodic structure, just like Match Theory. Thus, Wagner actually makes identical predictions to Match Theory here because what matters is whether recursive syntactic structure (i.e., a vP that dominates a DP) corresponds to recursive prosodic structure (i.e., two levels of prosodic structure). Because Wagner's theory makes identical predictions to Match Theory, I will not discuss Wagner's theory in detail in the rest of this chapter, and everything I say about Match Theory also applies to Wagner's theory.

We cannot directly compare the predictions of these theories (9) and (10) experimentally, but we can test them by comparing the prosody of (8) with that of other sentences like (7). Both edge-based theory and Match Theory would assign the following structure to (7) because *spinach* is at the right edge of a DP.

(11) *Prosodic structure of (7) assigned by edge-based theory and Elfner's Match Theory*
Max doesn't mix spinach)$_{φ}$ and chard.

[1] There are versions of edge-based theory that do allow for recursivity. For example, Selkirk (1995) and Truckenbrodt (1995, 1999) posited a ban against recursive prosodic structure which is violable. If other constraints dominate this constraint against recursivity, they could lead to recursive prosodic structure. The discussion here applies to edge-based theory (or any theory of syntax-prosody mapping) that bans recursivity in English coordination.

[2] There were different versions of Match Theory. Here I describe Match Theory in the classic sense a la Selkirk (2011). Elfner's (2015) version of Match Theory differs from the classic theory in that she does not match syntactic phrases to prosodic constituents directly, but requires the prosodic structure to replicate the dominance relations in syntax. Applying this requirement to coordination, this is equivalent to the classic Match Theory, and has the same effect of matching syntactic constituents to prosodic constituents.

Edge-based theory predicts that the prosodic boundary following *spinach* is the same for (7) and (8) because *spinach* is at the right edge of a φ in both (Figure 3). In contrast, according to Match Theory, *spinach* is at the right edge of two φs in (8) but only a single φ in (7). If we add an assumption to Match Theory that requires boundary strength to correlate with the levels of embedding (see section 1.1 of chapter 5 for a detailed discussion of this assumption), then Match Theory would predict that the prosodic boundary following *spinach* is larger in (8) than in (7) (Figure 4).

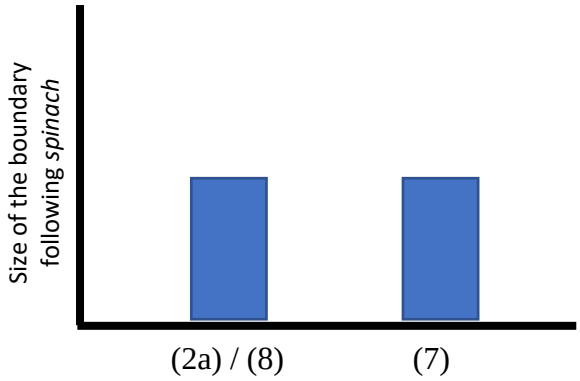


Figure 3: *Prediction of edge-based theory.*

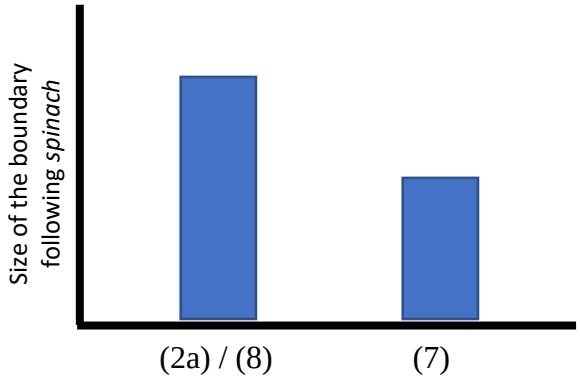


Figure 4: *Prediction of Match Theory.*

2. The experiment

I had conducted two separate experiments, with very similar experimental setup and material structure. The second experiment consisted of more groups of items and speakers than the first. These two experiments had very similar results, with the differences in each comparison trending in the same direction. I first report the design and results of the first experiment in detail in sections 2.1 to 2.7, and then mention the second experiment more briefly in section 3.

2.1. Materials

There were six sets of items. Each set consisted of three items, exemplified by (2a-b) and (7), repeated below:

(2) a. Max doesn't miss spinach but chard.
b. Max misses not spinach but chard.

(7) Max doesn't mix spinach and chard.

Each target sentence was shown to the subjects along with a leading context sentence and an interlocuter, speaker A's utterance to elicit the intended information structure in the target sentence in speaker B's utterance. For example, for (2a), the following materials were presented to the speaker.

(12) Context: Max has been on an all-meat diet.
A: Max misses spinach.
B: He doesn't miss spinach but chard.

The speaker was to read the context silently, and say the dialog in the given order. There were 90 filler items, some of which contained a context, a question and an answer, and others lacked a context. Section 6 presents all six sets of items.

2.2. Participants

I conducted a production study with six native speakers of North American English, who were all graduate students at MIT. They were remunerated a small sum for their time, and granted their written consent to being tested.

2.3. Data collection

Due to the pandemic, participants did the recording at their own homes following step-by-step instructions on how to set up the recording environment. They looked for a place at home with the least reverberation possible (e.g., a place with a lot of soft furniture), and sat in front of a computer that displayed one context-question-answer trio at a time. The stimuli plus fillers were presented in a pseudo-randomized order, so that minimal pairs were not placed next to each other. Participants were given instructions about the task at the beginning of the experiment, and asked to read quietly to themselves before reading out loud each trio. They were encouraged to act out the dialogues naturally rather than reading mechanically.

2.4. Data annotation and critical measure

The critical measure was the duration of the last rime of the word immediately before the critical prosodic boundary (e.g., for (2a-b) and (7), *ach* of *spinach*). I chose this durational measure because as Wightman et al. (1992) showed, the final rime of a word is lengthened before a phrase boundary, and the stronger / larger this boundary, the longer the rime. Thus, the duration of the last rime of spinach in (2a-b) and (7) is correlated with the strength of the prosodic boundary following *spinach*.

Two research assistants labeled that rime manually in Praat. Their annotations for the same segment differed by 11.9ms on average, and my data analysis was based on the more seasoned annotator's work. When labeling the rimes, we relied on cues to segmental boundaries. For example, the criterion for the end of *spinach* is the end of frication noise.

2.5. Data analysis

I fitted a linear mixed effects model, with the duration of the last rime as the dependent variable, and item as fixed effects. I calculated p-values using using Satterthwaite's degrees of freedom method. The model included random intercepts by speaker and item group, and random slope by speaker.

2.6. Results

The last rime before *but* in corrective *but* sentences with sentence negation (i.e., items like (2a), leftmost box in Figure 5) is 60.7 ms longer than the average duration of the last rime before *and* in *and* sentences (i.e., items like (7), rightmost box in Figure 5; p = 0.053, close to the conventional significance threshold of 0.05). The last rime before *but* in corrective *but* sentences with constituent negation (i.e., items like (2b), middle box in Figure 5) is 48.1 ms longer than the average duration of the last rime before *and* in *and* sentences (i.e., items like (7), rightmost box in Figure 5; p = 0.044). Finally, the last rime before *but* in corrective *but* sentences with sentence negation (i.e., items like (2a), leftmost box in Figure 5) does not differ significantly in duration from that in corrective *but* sentences with constituent negation (i.e., items like (2b), middle box in Figure 5). In Figure 5, the top and bottom of the boxes are the 75th and 25th percentiles, and the middle line is the median. The red dot is the mean, and the red lines are standard error bars.

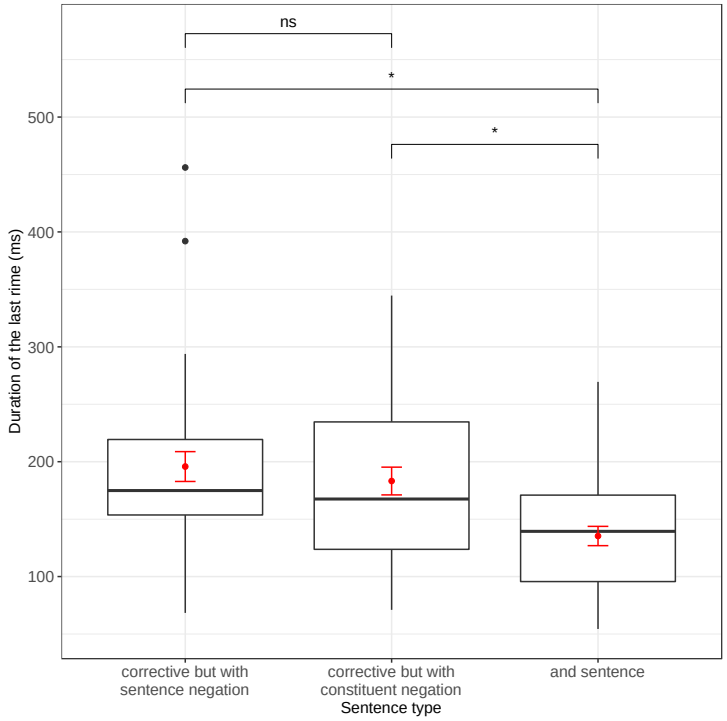


Figure 5: *Duration of the final rime before* but / and.

2.7. Discussion

The durational pattern suggests that the prosodic boundary before *but* does not differ significantly for corrective *but* with sentence negation (e.g., (2a)) and corrective *but* with constituent negation (e.g., (2b)), but those boundaries are larger than the boundary before *and* (e.g., (7)). This is consistent with the ambiguity approach to (2b) and Match Theory. The fact that the prosodic boundary before *but* in sentences like (2b) is greater than the prosodic boundary before *and* in sentences like (7) suggests that (2b) is structurally ambiguous: it can not only be analyzed as DP-coordination, but also larger coordination with ellipsis. The fact that a vP that contains a DP (e.g., the vP in (2a)) corresponds to a stronger prosodic phrase than just a DP (e.g., the DP in (7)) suggests that the prosodic structure is not completely flat. One way to implement this is to allow

for recursive φs (i.e., a φ can dominate another φ), and boundary strength depends on the number of φ-levels that a φ dominates.

3. A larger-scale experiment

Following the experiment I just presented, I conducted another experiment with very similar setup and material structure. The second experiment was on a larger scale, and consisted of eight groups of items and twenty speakers (who consisted mostly of non-student participants recruited via mailing lists for volunteers for experimental participants at MIT). Because of the large scale, annotation was done by Montreal Forced Aligner (McAuliffe et al. 2017) using acoustic models trained on LibriSpeech (Panayotov et al. 2015) rather than human annotators.

Just like in the first experiment, I fitted a linear mixed effects model, with the duration of the last rime as the dependent variable, and item as fixed effects. Unlike the first experiment, the model only included random intercepts by speaker and item group, but not random slope by speaker because the model that did include random slope resulted in a singular fit.

That experiment had very similar results as the first experiment, where the directions of the comparisons were the same, but the durational differences were smaller in number: the last rime before *but* in corrective *but* sentences with constituent negation (i.e., items like (2b), second box in Figure 6) was 17.2 ms longer than the last rime before *and* (i.e., items like (7), fourth box in Figure 6; $p < 0.01$); the last rime before *but* in corrective *but* sentences with sentence negation (i.e., items like (2a), first box in Figure 6) was 18.5 ms longer than the last rime before *and* (i.e., items like (7), fourth box in Figure 6; $p < 0.001$).

It is worth mentioning that in addition to testing *and* sentences and corrective *but* sentences with sentence negation and constituent negation like I did in the first experiment, the second experiment studied a fourth type of sentences: corrective *but* sentences with constituent negation but a sentential adverb in the second conjunct. (13) presents the context-speakerA-speakerB trio that elicits this target sentence.

(13) Context: Max has been on an all-meat diet, and misses a vegetable in particular. They're debating about what Max misses.
A: Max misses spinach.
B: He misses not spinach but probably chard.

I included this type of sentences because Collins (1988), Hirsch (2017) and others showed that sentential adverbs like *probably* require a clausal coordination analysis. If this is the case, then the grammaticality of (13B) is already evidence that corrective *but* with constituent negation can involve clausal coordination.

(14) *Syntactic analyses of (13B)*
a. He [$_{vP}$ misses **not** spinach] but [$_{vP}$ probably chard$_i$ ~~misses t$_i$~~].
b. [$_{TP}$ He misses **not** spinach] but [$_{TP}$ probably chard$_i$ ~~he misses t$_i$~~].

Following this analysis of sentential adverbs, I expected the prosodic boundary following *spinach* in (13B) to be larger than in strictly DP-coordination (i.e., *and* sentences like (7)), and also corrective *but* sentences with constituent negation but no sentential adverb (e.g., (2b)) because if sentences like (2b) are structurally ambiguous, they have a possible analysis involving DP-

coordination, but (13B) does not. That additional parse of DP-coordination might create the effect that on average, the prosodic boundary in (2b) is smaller than the boundary in (13B).

But the actual results did not follow this expectation. The last rime of *spinach* in (13B) (i.e., third box in Figure 6) did not differ significantly from the last rime before *and* (i.e., fourth box in Figure 6).

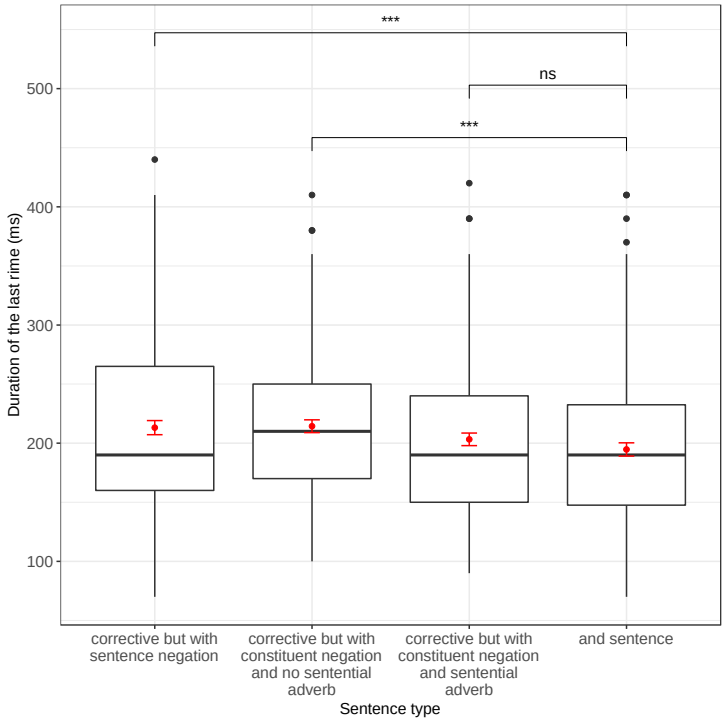


Figure 6: *Duration of the final rime before* but / and.

Impressionistically, instead of pausing before *but*, speakers often paused after *but* in (13B)–something they didn't do in the other corrective *but* sentences. In a separate experiment that studies the prosody of sentences that involve fragment answers to questions (see section 5.3 of chapter 5), I also included fragment answers with *and* coordination plus a sentential adverb (e.g., *Evidently he bought a handbag and regrettably a diamond.*), and found a similar behavior: instead of pausing before *and*, speakers often paused after *and* and before the sentential adverb. I suspect a lot more is going on than what we currently understand, and perhaps these sentential adverbs tend to trigger a large prosodic boundary before them, which in turn may affect the boundaries around the coordinators *but* and *and*. If this is the case, then it suggests that interestingly, prosody can be affected by more factors than we currently understand. I leave this question to future research.

4. Possible alternative explanation

In the corrective *but* sentences, each conjunct (i.e., *spinach* and *chard* in (2a-b)) is focused separately, but the context of the *and* sentence (7) was set up in a way that the entire conjunction carries focus.

(15) Context: Max is particular about cooking: he mixes all sorts of vegetables, except two kinds.
A: What doesn't Max mix?
B: He doesn't mix spinach and chard.

We might thus consider an alternative explanation for the experimental results, and say that the results do not tell us anything about syntactic theory or syntax-prosody mapping, but are completely due to focus: perhaps focused material is surrounded by a stronger prosodic boundary than unfocused material. Because *spinach* is narrowly focused in (2a-b) but not in (7), it is followed by a stronger prosodic boundary in (2a-b) than in (7). Focus is marked for (2a-b) and (7) below:

(2) a. Max does**n't** miss [spinach]$_F$ but [chard]$_F$.
b. Max misses **not** [spinach]$_F$ but [chard]$_F$.

(7) Max doesn't mix [spinach and chard]$_F$.

I discuss two potential issues for this alternative hypothesis. First, there is no empirical evidence that suggests that focus can affect prosodic boundary this way in English. Second, even when we control for focus by putting double focus in the *and* sentence, there is still a difference in prosodic boundary.

4.1. Empirical challenge 1 for the alternative

There is no empirical evidence that supports the alternative hypothesis, in formal experiments or in informal observations reported in the literature. In this dissertation, I have presented two experiments that search for prosodic effects of focus on prosodic boundary–one in chapter 5 and the other in appendix B, but did not find any significant effect in either study.

In addition, Kratzer & Selkirk (2020) made an informal observation that in English, focus cannot create ι-phrasing, even if it might create weaker prosodic boundaries, but ι-phrasing is precisely what the alternative hypothesis requires here. To understand why, I first present Kratzer & Selkirk's proposal of how focus can affect prosodic structure on top of the effects by syntax-prosody mapping, and then show that it cannot derive the experimental results here. Kratzer & Selkirk's proposal is based in the OT framework, and they proposed a family of constraints that require a focused constituent to be spelled out as the head (i.e., the most prominent sub-constituent) of an intonational phrase (ι), the head of a phonological phrase (φ), and the head of a prosodic word (ω). We can imagine that if some of these constraints outrank Match Theory constraints, which require faithful mapping from syntax to prosody, then prosodic phrasing might deviate from syntactic constituency in order to ensure that focused material is the prosodic head.

According to the alternative hypothesis, (2a) can only be analyzed as DP-coordination, and the prosodic difference I found between (2a) and (7) is completely due to focus. Because (2a) and (7) have the same syntactic structure, and both involve DP-coordination, the syntax-prosody mapping would put *spinach* at the right edge of a φ in both (2a) and (7) because *spinach* is its own DP, and a DP-boundary corresponds to a φ-boundary. Thus, Kratzer & Selkirk's constraints that require focus to be the head of a φ and an ω are trivially satisfied in (2a) and (7), and do not make a difference here. Therefore, I focus on the constraint that requires focus to be the head of an ι. Kratzer & Selkirk made an informal observation that in English, that constraint cannot alter ι-phrasing created by syntax-prosody mapping, and therefore should be outranked by mapping

constraints. Assuming that the constraint ranking for (2a) and (7) is the same as the ranking for Kratzer & Selkirk's sentences, this suggests that focus cannot alter ι-phrasing in (2a) and (7) either, contrary to what the alternative hypothesis claims.

4.2. Empirical challenge 2 for the alternative: Follow-up experiment

Not only does the alternative hypothesis lack empirical evidence, but it also fails to account for results of a follow-up experiment. In this follow-up experiment, I addressed the objection raised by the alternative hypothesis by making the question of (2a) a double *wh*-question, and keeping the interlocutor's utterance for (2a-b) as is, so that now all the target sentences put double focus on each conjunct. (16) is the new context and dialog for the *and* sentence, while (17) is the context and dialog for the corrective *but* sentences.

(16) Context: Max is particular about his smoothie: he mixes all sorts of ingredients, except a vegetable and a fruit.
A: Which vegetable and which fruit doesn't Max mix?
B: He doesn't mix spinach and pears.

(17) Context: Max has been on an all-meat diet, and misses something in particular. They're debating about what Max misses.
A: Max misses spinach.
B1: He doesn't miss spinach but pears.
B2: He misses not spinach but pears.

Holding constant the focus structure across target sentences, if the results between the sentences are the same as what we saw with the previous experiment, then we can draw conclusions about the syntactic analysis of (17B2) and the prosodic mapping of vPs. Specifically, if there is still a significant difference between (16B) and (17B2), then this suggests that (17B2) is structurally ambiguous. If there is still a significant difference between (16B) and (17B1), then this suggests that a vP that contains a DP corresponds to a stronger prosodic phrase than just a DP.

4.2.1. Methods

I conducted a production study with eight sets of items (which were modified version of the items in the previous experiment) and three native speakers. All eight sets of items are presented in Section 6.

Recording took place in a sound-attenuated booth in the Linguistics Department of MIT. Participants were seated in front of a computer, which displayed one context-question-answer trio at a time. The stimuli were presented in random order, so minimal pairs were not placed next to each other. Participants were given instructions about the task at the beginning of the experiment, and time to read quietly before reading out loud each trio. They were encouraged to act out the dialogues naturally rather than reading mechanically.

The method of data annotation and analysis was very similar to the method of the previous experiment. I labelled the last rime of the last word before *and* / *but*. Then I fitted a mixed effect model, with the duration of the rime as the dependent variable, and item as fixed effects. I calculated p-values using using Satterthwaite's degrees of freedom method. The model included

random intercepts by speaker and item group. It did not include random slope by speaker because a model that did include it resulted in a singular fit.

4.2.2. Results

The last rime before *but* in corrective *but* sentences with sentence negation (i.e., items like (2a), leftmost box in Figure 7) is 80.8 ms longer than the average duration of the last rime before *and* in *and* sentences (i.e., items like (7), rightmost box in Figure 7; $p < 0.001$). The last rime before *but* in corrective *but* sentences with constituent negation (i.e., items like (2b), middle box in Figure 7) is 94.0 ms longer than the average duration of the last rime before *and* in *and* sentences (i.e., items like (7), rightmost box in Figure 7; $p < 0.001$). Finally, the last rime before *but* in corrective *but* sentences with sentence negation (i.e., items like (2a), leftmost box in Figure 5) does not differ significantly in duration from that in corrective *but* sentences with constituent negation (i.e., items like (2b), middle box in Figure 5).

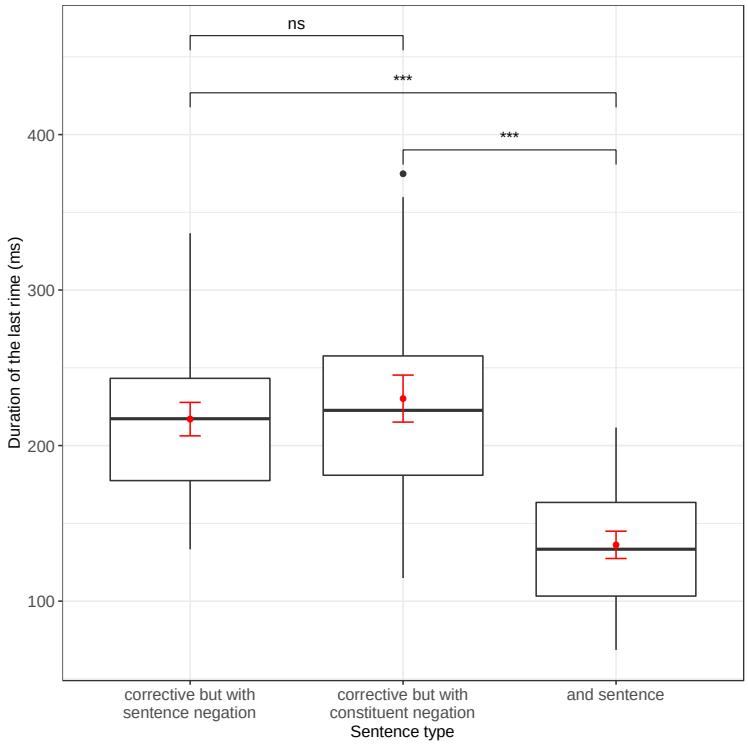


Figure 7: *Duration of the final rime before* but / and.

4.2.3. Discussion

Holding constant the focus structure across sentences, there is still a significant prosodic difference between each corrective *but* sentence and the *and* sentence, suggesting that the corrective *but* sentence with constituent negation like (17B2) is structurally ambiguous between DP-coordination and larger coordination plus ellipsis, and that a vP containing a DP corresponds to a stronger prosodic phrase than just a DP.

5. Conclusion

This chapter presented an experiment with consequences for two separate research questions. First, the prosodic realization of corrective *but* sentences supports one syntactic analysis over the other, and suggests that these sentences can involve more underlying syntactic structure than what they appear, and that structure has been obscured by ellipsis. Second, the prosodic realization of some other corrective *but* sentences suggests that at least in English coordination, the prosodic structure tracks the syntactic structure more closely than the Strict Layer Hypothesis claimed, and allows recursive prosodic structure.

This experiment is proof of concept that prosodic evidence can diagnose ellipsis, and that we can draw evidence from prosodic experiments for syntactic claims, especially when traditional sources of evidence such as word order are not so clear. It also shows that we can in turn use syntax as the foundation for investigating issues about syntax-prosody mapping.

6. Experimental items

This section presents the entire sets of experimental items for both the main experiment that was presented in section 2 and the follow-up experiment that was presented in section 4.2.

6.1. Main experiment

This section presents the entire set of experimental items. There were six sets, each set containing three context-speakerA-speakerB trios. In each set, the corrective *but* sentences have the same context and A's utterances, which I do not repeat here, but the complete trio was presented to the speakers. The (a) items are *and* sentences; the (b) items are corrective *but* sentences with sentence negation; the (c) items are corrective *but* sentences with constituent negation.

(18) a. Context: Max is particular about cooking: he mixes all sorts of vegetables, except two kinds.
A: What doesn't Max mix?
B: He doesn't mix spinach and chard.

b. Context: Max has been on an all-meat diet.
A: Max misses spinach.
B1: He doesn't miss spinach but chard.
B2: He misses not spinach but chard.

(19) a. Context: This recipe requires not blending two ingredients.
A: What didn't Jen blend?
B: She didn't blend tomatoes and potatoes.

b. Context: Jen was the cook tonight.
A: Jen blended tomatoes.
B1: She didn't blend tomatoes but potatoes.
B2: She blended not tomatoes but potatoes.

(20) a. Context: The students must review all but one paper.
A: Which paper didn't Judy review?
B: She didn't review Jacobson and Halle.

b. Context: The students must review one paper.
A: Judy reviewed Jacobson.
B1: She didn’t review Jacobson but Halle.
B2: She reviewed not Jacobson but Halle.

(21) a. Context: Jasper gathered every couple on their anniversary except one.
A: Who didn't Jasper gather?
B: He didn't gather Robert and Michael.

b. Context: They are sorting out people's relations in a book.
A: Jasper fathered Robert.
B1: He didn't father Robert but Michael.
B2: He fathered not Robert but Michael.

(22) a. Context: The students were allowed to skip a reading.
A: Which paper didn't Tom read?
B: He didn't read Lasnik and Saito.

b. Context: The students were required to read one paper.
A: Tom read Lasnik.
B1: He didn’t read Lasnik but Saito.
B2: He read not Lasnik but Saito.

(23) a. Context: In writing a new draft of the paper, James decided not to combine two parts from his old paper.
A: What didn't James combine?
B: He didn't combine the analysis and the conclusion.

b. Context: James is revising his paper.
A: James refined the analysis.
B1: He didn't refine the analysis but the conclusion.
B2: He refined not the analysis but the conclusion.

6.2. Follow-up experiment

There were eight sets, each set containing three context-speakerA-speakerB trios. In each set, the corrective *but* sentences have the same context and A’s utterances, which I do not repeat here, but the complete trio was presented to the speakers. The (a) items are *and* sentences; the (b) items are corrective *but* sentences with sentence negation; the (c) items are corrective *but* sentences with constituent negation.

(24) a. Context: Max is particular about his smoothie: he mixes all sorts of ingredients, except a vegetable and a fruit.
A: Which vegetable and which fruit doesn't Max mix?
B: He doesn't mix spinach and pears.

b. Context: Max has been on an all-meat diet, and misses something in particular. They're debating about what Max misses.
A: Max misses spinach.
B1: He doesn't miss spinach but pears.
B2: He misses not spinach but pears.

(25) a. Context: This recipe keeps a green vegetable and a root vegetable strictly separate throughout the preparation process.
A: Which green vegetable and which root vegetable didn't Jen blend?
B: She didn't blend asparagus and potatoes.

b. Context: This smoothie recipe requires blending a vegetable. They're debating about what Jen blended.
A: Jen blended asparagus.
B1: She didn't blend asparagus and potatoes.
B2: She blended not asparagus but potatoes.

(26) a. Context: Jess the teacher asked all the tutors and students to do homework in pairs except one tutor and one student because they don't get along with each other.
A: Which tutor and which student didn't Jess ask to do homework together?
B: She didn't ask Madison and Evelyn.

b. Context: They're talking about who Jess talked to at the party.
A: Jess talked to Madison at the party.
B1: She didn't ask Madison and Evelyn.
B2: She talked to not Madison but Evelyn.

(27) a. Context: Jasper gathered all the boys and girls in pairs for the game show except one boy and one girl.
A: Which boy and which girl didn't Jasper gather?
B: He didn't gather Jacob and Susan.

b. Context: They're talking about who Jess talked to at the party.
A: Jasper invited Jacob.
B1: He didn't invite Jacob but Susan.
B2: He invited not Jacob but Susan.

(28) a. Context: Billy invited all the actors and actresses to waltz with each other, except one actor and one actress because they are too clumsy.
A: Which actor and which actress didn't Billy invite to waltz together?
B: He didn't invite Lucas and Mary.

b. Context: They're talking about who Jess talked to at the party.
A: Billy met up with Lucas.
B1: He didn't meet up with Lucas but Mary.
B2: He met up with not Lucas but Mary.

(29) a. Context: James the alchemist melds any light metal and any heavy metal together, except these two.
A: Which light metal and which heavy metal didn't James meld?
B: He didn't meld aluminum and platinum.

b. Context: They are talking about which metal James the alchemist melted.
A: James melted aluminum.
B1: He didn't meld aluminum and platinum.
B2: He melted not aluminum but platinum.

(30) a. Context: Ava was asked to merge the odd-numbered pages with the even-numbered pages, but she left out two pages.
A: Which odd-numbered page and which even-numbered page didn't Ava merge?
B: She didn't merge page seven and page ten.

b. Context: They are talking about which part of the document Ava revised.
A: Ava revised page seven.
B1: She didn't revise page seven but page ten.
B2: She revised not page seven but page ten.

(31) a. Context: Lily is passionate about gardening, and has cross-bred all the plants in her garden except one flower and one fruit.
A: Which flower and which fruit didn't Lily cross-breed?
B: She didn't cross-breed the orchid and the apple.

b. Context: They are discussing which plant Lily fertilized yesterday.
A: Lily fertilized the orchid.
B1: She didn't fertilize the orchid but the apple.
B2: She fertilized not the orchid but the apple.

Appendix A[1]
Two notes on clausal ellipsis

1. Introduction

In chapters 2 and 4, I argued that ellipsis can occur in *either…or…* and corrective *but* sentences, and this ellipsis is stripping (also known as "bare argument ellipsis"). Traditional accounts of stripping assume that it is a type of clausal ellipsis (e.g., Depiante 2000); Merchant 2004). Clausal ellipsis involves movement out of the ellipsis site plus deletion of a TP (e.g., Merchant 2004, van Craenenbroeck & Merchant 2013).[2] In addition to stripping, other ellipses commonly assumed to be clausal ellipsis are sluicing, fragment answers and stripping. These types of clausal ellipsis share the property of movement plus TP-deletion, and differ in the nature of the moved phrase and the sentential environment in which the ellipsis takes place. In sluicing, the constituent that moves out of the ellipsis site and survives ellipsis (the *remnant*) is a *wh*-phrase (*who* in (1)). Fragment answers are direct answers to questions (*Pat* in (2)). Stripping occurs in a coordinated structure (e.g., *either…or…* and negation…*but*… as previous chapters have shown), reduces the second conjunct in the coordination, and requires a remnant (*Chris* in (3)) and sometimes one more element (e.g., *not* or *also*). The element that coordinates structures (e.g., *but, or* and *and*) is optional.

(1) Someone here speaks Wampanoag–guess who$_i$ [$_{TP}$ ~~t_i speaks Wampanoag~~]. *Sluicing*
(2) A: Who speaks Wampanoag?
B: Pat$_i$ [$_{TP}$ ~~t_i speaks Wampanoag~~]. *Fragment answer*
(3) Pat speaks Wampanoag, (but) not Chris$_i$ [$_{TP}$ ~~t_i speaks Wampanoag~~]. *Stripping*

This appendix is a collection of two notes about clausal ellipsis, with a focus on stripping. The first half of the appendix discusses a property well-known to clausal ellipsis–that is, the movement of the remnant in these ellipses can sometimes appear to be insensitive to island constraints (first observed by Ross (1969)). I will argue that the apparent ability of clausal ellipsis to evade islands is an illusion: movement in clausal ellipsis cannot cross islands, just like movement in pronounced structure. The illusion that it can is created by what I call *the short source*–the elided phrase corresponds to a subpart of the previous sentence that does not include any islands.

In the second half of the appendix I will show that not only can the elided phrase correspond to a subpart of the previous sentence, but the elided phrase can correspond to a subpart of the previous sentence that is smaller than a TP, contrary to previous assumptions that clausal ellipsis must delete at least a finite TP (e.g., Depiante's 2000 and Merchant's 2004 assumptions about stripping). If we apply this analysis to sluicing, it can potentially resolve a puzzle about the observed mismatch in sluicing (e.g., Rudin 2019, Anand et al. 2021, Ranero 2021).

In this appendix, I will focus on stripping because it offers unique insights due to some of its particular properties. First, (4a-c) show the apparent island violations in clausal ellipsis. (4a-b) are examples from the literature, to which I add my own (4c):

[1] The first half of this appendix, section 2, is largely based on a squib that was recently accepted by *Glossa* called "Island violations in stripping constructions".

[2] Some argue that a C' is deleted instead (Heck & Müller 2003, Thoms 2010; Döring 2014; Messick & Thoms 2016). It does not matter to this appendix whether a TP or a C' is deleted in clausal ellipsis, and in the rest of the appendix I will just assume that a TP is deleted for consistency.

(4)a. They hired someone who speaks a Balkan language–guess which!
Sluicing (Merchant 2001:209)
b. A: Does Abby speak the same Balkan language that someone in your class speaks?
B: Yeah, Charlie. *Supplemental answer*[3] (Griffiths and Liptak 2014:193)
c. They hired someone who speaks French yesterday, not German. *Stripping*

If we follow the standard analysis of clausal ellipsis, the remnant moves out of a relative clause, which is generally considered to be an island, and yet the result is fine (5a). Without ellipsis, it is not possible to move a *wh*-phrase out of a relative clause (5b).

(5)a. … guess which$_i$ [$_{TP}$ ~~they hired [$_{Relative\ Clause}$ someone who speaks t_i]~~]!
b. *… guess which they hired someone who speaks!

Section 2 argues with four new pieces of evidence that when clausal ellipsis appears to be able to evade islands, the elided phrase comes from a short source that does not contain any island.

Depiante (2000) and Merchant (2004) have assumed that stripping always deletes at least a TP. Section 3 shows with four pieces of evidence based on scope in stripping that stripping can have a source that is smaller than a TP. Therefore, contrary to what its name might suggest, clausal ellipsis can in fact delete phrases smaller than a TP. This analysis can potentially be extended to other types of clausal ellipsis such as sluicing and resolve a puzzle there. If we follow the assumption that the ellipsis remnant undergoes focus movement (e.g., Depiante 2000; Merchant 2004, 2008; Yoshida et al. 2015), then the finding in section 3 also has implications for our understanding of the location of FocusP. This appendix argues that the ellipsis remnant does not have to move to a position above the matrix TP, but can land below it, somewhere above the vP but below the TP. If this is correct and the remnant moves to Spec, FocusP, then this suggests that there are more locations for FocusP than previously thought. There is FocusP at the left periphery of a finite sentence, but there can also be FocusP between TP and vP. Finally, section 4 concludes the appendix.

2. Evasion strategy

There have been many proposals for the seemingly exceptional island-violating behavior of clausal ellipsis (e.g. Ross 1969; Lasnik 2001 & 2005; Merchant 2001 & 2004; Fukaya 2007; Szczegielniak 2008; Abels 2011; Griffiths & Liptak 2014; Barros 2013; Barros et al. 2014; Yoshida et al. 2019). This section presents evidence from stripping that supports Barros et al.'s approach, which was built on Merchant (2001), Fukaya (2007) and Abels (2011), and was originally proposed for sluicing. I extend their claim to stripping and clausal ellipsis in general, and add novel evidence based on new contexts (e.g., contradictory contexts). Following Barros et al., I argue that the apparent ability of stripping to violate islands is an illusion created by *the evasion strategy*–a parse that does not involve any islands. If all types of clausal ellipsis have the same underlying operations, the evasion strategy available to stripping should also be available to clausal ellipsis generally.

[3] Griffiths & Liptak (2014) called the entire sentence in (4B) *fragment answer*. If we follow the definition that fragment answers are direct answers to questions, then strictly speaking, only *Yeah* is the fragment answer. I therefore consider *Charlie* in (4bB) a fourth type of clausal ellipsis called *supplemental fragment*. It does not really matter to the claims of this appendix whether *Charlie* in (4bB) is a fragment answer or supplemental fragment because the scope of this appendix is clausal ellipsis generally, and the claims I make should apply to all types of clausal ellipsis.

Barros et al. (2014) have proposed many different evasion strategies. This section argues for one type specifically–*the short source*, which was first proposed by Merchant (2001) for sluicing. The short source involves ellipsis of a subpart of the antecedent clause that doesn't include the island, and creates the illusion of relative clause island violation in sluicing. Under this analysis, (4a) is fine because it has a parse whose elided phrase does not contain any island (6). In this parse the *wh*-remnant still moves out, but it does not cross any island. This parse contrasts with (5a), whose elided phrase is isomorphic to the antecedent. I call the isomorphic parse *the long source*. Furthermore, Merchant and Barros et al. (2014) suggested that the elided subject in the short source is an E-type pronoun in the sense of Evans (1980). This E-type pronoun refers to the indefinite in first conjunct, but is not in the scope of the indefinite.[4]

(6)They hired someone$_i$ who speaks a Balkan language, guess which [~~$_{TP}$ he$_i$ speaks~~]]!

Assuming the short source is also available to stripping, the stripping sentence (7) should have two potential parses: the long source (8a), whose remnant *German* crosses a relative clause island, and the short source (8b), whose remnant does not cross any island.

(7)They hired someone who speaks French yesterday, not German.
(8)a. … not German$_i$ [~~$_{TP}$ they hired [$_{Relative\ clause}$ someone who speaks t$_i$~~]]. *Long source*
b. … not German$_i$ [~~$_{TP}$ she (= the person they hired) speaks t$_i$~~]]. *Short source*

Barros et al. argued for the evasion strategies in sluicing by showing that when the evasion strategies are blocked (e.g., by replacing the indefinite *someone* with a negative quantifier or an NPI indefinite), ellipsis cannot appear to be island-insensitive any more. These arguments can be replicated here, but I will not repeat them here due to space. Instead, I will present four new arguments by taking advantage of some properties of stripping that sluicing and fragment answers do not have.[5] While the long source and the short source for sluicing often have the same meaning ((5a) and (6)), I will show that stripping offers an opportunity to disambiguate them: once we manipulate the second conjunct carefully, we can get the short source to take on a different meaning from the long source. Crucially, in those cases, we get the meaning of the short source, suggesting that the short source is available.

Subsections 2.1–2.4 provide four novel arguments that the evasion strategy saves island violations in stripping. Yoshida et al. (2019) explicitly rejected the evasion strategy as a source available to stripping. Subsection 2.5 responds to this critique, and argues that Yoshida et al.'s examples don't allow the evasion strategy for independent reasons. Once these extraneous factors are controlled for, the evasion strategy is in fact available to stripping and can save island violations. Subsection 2.6 provides an interim summary of this section.

[4] This configuration satisfies the licensing condition on ellipsis that has been proposed in the literature. See Merchant (2001), for example, for a discussion on how it satisfies his semantic identity condition.

[5] I will not provide any traditional evidence based on connectivity effects for the short source here, which a reviewer asked about. Evidence involving case, P-stranding and selection does not apply here because the remnant in the short source and the remnant in the long source are selected for by the same verb, and therefore have the same case and P-stranding profile. Evidence involving binding is notoriously unclear (see Barros et al. 2014 for a discussion and their failed attempt to replicate Lasnik's 2001 judgments). Sentences involving NPI-licensing are confounded because they involve entities that do not exist, and E-type pronouns, which are used in the short source, cannot refer to non-existent entities.

All the judgments in this section come from two informal surveys. In each survey, I asked native speakers to rate sentences on a scale of 1-7, and if they found them grammatical, I further asked them which reading(s) they could get. The first survey involved seven speakers, and later I carried out a follow-up survey with five out of those seven speakers. The order in which I present the sentences in this section does not necessarily follow the temporal order in which I carried out the surveys. Thus, to be clear, for each sentence I will report the total number of speakers I asked and their judgments.

2.1. Evidence 1 for the short source: Availability of the short source when there is no island

The discussion so far focuses on sentences that contain islands, specifically relative clause islands, which might lead us to think that the short source is only relevant to these sentences, but it does not have to be. This section argues that stripping sentences can have the short source, even when they do not contain any island. Consider (9).

(9)They said fewer than three students speak French yesterday, and also German.

Following are the two possible parses of (9). The short source (10b) has a different meaning from the long source (10a).

(10) a. … and also German$_i$ [~~TP they said fewer than three students speak t_i~~]. *Long source*
b. … and also German$_i$ [~~TP they speak t_i~~]. *Short source*

The long source is compatible with a scenario where they talked about two different groups of students, French speakers and German speakers. The short source, on the other hand, is not compatible with this scenario, and means that they mentioned the same group of students who speak both French and German. Two out of my five consultants could get the short source reading, suggesting that at least for those speakers, the short source is available even when there is no island involved.

As to the long source reading, three out of my five consultants could get it. Though the long source is interesting in its own right, it is beside the point here. The point is to show that the short source reading is available, but not that the long source reading is.

The long source *is* generally available, but may require certain contexts, as Reinhart (1991:374) showed. For example, (11a) means that Lucie will not admit that she stole the car, not that Lucie will admit that she did not steal the car, suggesting that the remnant *the car* must have moved across the finite clause boundary (not [the car]$_i$ ~~Lucie will admit that she stole t_i~~).

(11) a. Lucie will admit that she stole the diamonds if you press her, but not the car.
b. Lucie did not admit that she stole anything, when we pressed her, except the little red book.
c. More people said they will vote for Bush, in the last poll, than for Dukakis.
(Reinhart 1991:374)

I leave it to future research exactly which contexts bring out the long source reading easily, but instead focus on the availability of the short source in this squib.

2.2. Evidence 2 for the short source: Availability of the short source when there is an island

This subsection continues the logic of the previous one by showing that when the short source has a different reading from the long source, we can get the reading of the short source. Consider (12), which differs from (9) minimally in that (12) contains an island.

(12) They hired someone who speaks French yesterday, and also German.

I put the two potential parses of (12) below, which have different truth conditions:

(13) a. … and also German$_i$ [~~$_{TP}$ they hired [$_{RC}$ someone who speaks t_i yesterday~~]]. *Long Source*
b. … and also German$_i$ [~~$_{TP}$ she (= the person they hired) speaks t_i~~]]. *Short source*

The island-violating parse (13a) is true if they hired two monolingual speakers, a French speaker and a German speaker. The short source (13b) is only true if they hired a bilingual speaker who speaks both French and German.

Six out of seven speakers rated (12) 7 on a scale of 1-7. I further asked them how many people were hired. Everyone said only one bilingual person was hired, but one consultant said "maybe another interpretation is available, too," where two monolinguals were hired, but this reading is harder than the interpretation of hiring a bilingual person.

Thus, nearly all the speakers can get the short source reading of (12), an indication that the short source is present. Because (7) is very similar to (12), we may infer that (7) also has the short source.

2.3. Evidence 3 for the short source: Contradictory contexts

This subsection takes advantage of the observations in the previous subsections: when the sentence has no island, both the long source and the short source readings are available; but when the sentence contains an island, as in (12), the long source reading disappears for most speakers. This subsection blocks the short source with a contradictory context. In this context, the long source should be the only possible reading for a sentence that doesn't contain any island. The sentence that contains an island can no longer appear to be island-insensitive.

Recall that the short-source readings in the previous subsections talk about bilingual speakers. We can thus block them with a contradictory context by using *monolingual* in the first conjunct. All my five consultants reported that the sentence that doesn't contain any island (14) only has the long source (15a), presumably because the short source (15a) is contradictory.

(14) They said fewer than three monolingual students speak French yesterday, and also German.

(15) a. … and also German$_i$ [~~$_{TP}$ they said fewer than three monolingual students speak t_i~~]. *LongS*
b. #… and also German$_i$ [~~$_{TP}$ they speak t_i~~]. *Short source*

All my seven consultants found the sentence that contains an island ungrammatical:

(16) *They hired a monolingual who speaks French yesterday, and also German.

Example (16) is bad because neither of its potential parses (17a-b) is possible. The long source (17a) is not available (for different reasons for different speakers: for those who could not get the long source reading for (9) and (14), because the long source reading is somehow not available to begin with, even if there is no island; for those who could get the long source reading for (9) and (14), due to the presence of the island). The short source (17b) is blocked by *a monolingual* in the antecedent.

(17) a. *… and also German$_i$ [~~$_{TP}$ they hired [$_{RC}$ a monolingual who speaks t$_i$~~]]. *Long source*
b. #... and also German$_i$ [~~$_{TP}$ she (= the person they hired) speaks t$_i$~~]. *Short source*

The following sentences make the same point but with different lexical items and PP objects.[6]

(18) a. They need to find a monolingual speaker of Ch'ol for this course, and also Nahuatl.
b. They want to drive along the only road to Goose Bay on this trip, and also Nordkapp.

Example (18a) can only mean that they need to find two different monolingual speakers, and (18b) can only mean that they want to drive along two different roads. Compare them with (19), which contains the relative clause island, and should be ungrammatical because the island blocks the long source. All five of my consultants confirmed that there is a contrast between (18a) and (19a), and between (18b) and (19b).

(19) a. *They need to find a monolingual who speaks Ch'ol for this course, and also Nahuatl.
b. *They want to drive along the only road that leads to Goose Bay on this trip, and also Nordkapp.

2.4. Evidence 4 for the short source: Russian

This subsection makes a similar argument, but with a different language, Russian. Stripping in Russian can appear to be island-insensitive, but with the short source reading. When the short source is spelled out overtly, it has the same intonation as the intonation of the stripping sentence, suggesting that the short source is indeed the reason why stripping can appear to be island-insensitive in Russian.

Russian has relative clause islands when there is no ellipsis, just like English, but the remnant of stripping can appear insensitive to the relative clause island (20). (20) only has the reading that they hired a single bilingual speaker, suggesting that only the short source is available. Also, (20) is only fine if a significant intonational break precedes *a*, and another shorter break may follow *takzhe*.[7]

[6] I'm grateful to a Glossa reviewer for providing these examples, which I made some modification to.

[7] As a reviewer pointed out, the correlate (i.e., the phrase in the antecedent that corresponds to the remnant, which is *po-francuzski* in (20)) is in the utterance-final position in (20) (my consultants preferred to put the temporal adverb immediately after the subject), which might make the long source reading exceptionally available in English (see the discussion of the utterance-finality effect in section 2.5). The fact that the long source reading is missing for (20) suggests that if the utterance-finality effect is what saves the long source in English, then this effect is not active in Russian.

(20) Oni vchera nanyali kogo-to, kto govorit po-francuzski, a
They yesterday hired who-EI who speaks at-French, and
takzhe po-nemecki.
also at-German.
Intended meaning: 'They hired someone who speaks French, and also German.'

The meaning of (20) already suggests that its appearance of island-insensitivity is due to the short source. In addition, when the short source is spelled out overtly (21), it also requires the same intonation, where a significant break must immediately precede *a*, and a shorter break may follow *takzhe*.[8]

(21) Oni vchera nanjali kogo-to, kto govorit po-francuzski, a takzhe
They yesterday hired who-EI who speaks at-French, and also
ètot chelovek govorit po-nemecki.
this person speaks at-German.
Intended meaning: 'They hired someone who speaks French yesterday, and this person also speaks German.'

Since (20) only has the short source reading, and both (20) and (21) require the intonational breaks, the short source (21) must be the reason why (20) is grammatical.

2.5. Yoshida et al.'s (2019) rejection of the evasion strategy

Yoshida et al. (2019) presented experimental results showing that the evasion strategies can't be the reason why stripping can violate islands. They constructed stripping examples where the remnant is an R-expression that is co-indexed with the matrix subject in the antecedent, as in (22).

(22) Joe: While Joe was singing, she$_i$ noticed the student who met with *Bill*.
Bill: *No, with *Mary*$_i$. (Yoshida et al. 2019:1536)

If we follow the strict definition at the beginning of this squib that stripping has to occur in coordination, then Yoshida et al.'s examples are not stripping. Because *with Mary* in (22) adds information to the polar answer, I call it *supplemental fragment*. But exactly what to call (22) may not matter to us, if we assume that supplemental fragments, like stripping and other types of clausal ellipsis, involve movement of the remnant (i.e., with Mary) and deletion of a clause. If supplemental fragments involve the same types of syntactic operations as stripping, then the evasion strategies available to stripping should be available to supplemental fragments as well.

Returning to the analysis of (22), (23) spells out the possible derivations for the response in (22). In the long source (23a), the matrix subject *she* c-commands the trace of the remnant, incurring a Condition C violation. The short source (23b), if available, avoids such a violation

[8] As a Glossa reviewer pointed out, the correlate (i.e., the phrase in the antecedent that corresponds to the remnant, which is *po-francuzski* in (20)) is in the utterance-final position in (20) (my consultants preferred to put the temporal adverb immediately after the subject), which might make the long source reading exceptionally available in English (see the discussion of the utterance-finality effect in section 2.5). The fact that the long source reading is missing for (20) suggests that if the utterance-finality effect is what saves the long source in English, then this effect is not active in Russian.

because it does not include the matrix subject.[9] (22) received low ratings from subjects, suggesting that the short source is not available.

(23) a. Bill: No, with *Mary*$_i$ [~~TP she$_i$ noticed the student who met t$_i$~~]. *Long source*
b. Bill: No, with *Mary*$_i$ [~~TP {he / the student} met t$_i$~~]. *Short source*

Yoshida et al. had two controls. In the first control, they tested another dialog with a pronoun instead of an R-expression in the remnant, which would avoid the Condition C violation. The control sentences received higher ratings, suggesting a real Condition C effect for (22). Then they did another control experiment to show that the effect is not due to the implausibility of cataphoricity (where a pronoun linearly precedes the expression it refers to), but to c-command. In this experiment, they kept the R-expression in Bill's sentence, but varied the position of the pronoun in Joe's sentence: the pronoun either appears in the adjunct clause (which would not c-command the R-expression in the long source), or in the main clause (which would c-command the R-expression in the long source). Dialogs where the pronoun appears in the adjunct clause receive higher ratings, suggesting that even for cataphoric pronouns, c-command still plays a role.

I agree that the short source is not available to (22); but when the short source is spelled out overtly, it already sounds odd:

(24) Joe: While Joe was singing, she$_i$ noticed the student who met with *Bill*.
Bill: #No, {he / the student} met with *Mary*$_i$.

I speculate that (24) is odd because *no* can only deny Joe's main assertion here, but not the content in the relative clause, which is presupposed. Thus, the badness of the short source may be due to the setup of this particular discourse. I leave the exact reason for future research, and simply point out that the short source is not available to (22) to begin with. When the short source is available, it does save an island violation.

Besides arguing against the short source, an important claim of Yoshida et al. is that the long source is available to stripping (or what I call supplemental fragments), even when an island is involved. In other words, stripping is genuinely island-insensitive. This seems to directly contradict my findings in subsections 2.2 and 2.3, where most of my consultants reject the long source reading of the stripping sentences that contain an island ((12) and (16)).

I want to briefly discuss two possible reasons why Yoshida et al.'s examples generated apparently contradictory results to mine. One possible reason is the utterance-finality of the correlate (i.e., the phrase in the antecedent that corresponds to the remnant, such as *with Bill* in (22)). Yoshida et al.'s sentences all involve utterance-final correlates, whereas none of mine does. Barros et al. (2014) and Griffiths & Liptak (2014, fn. 10 and 28) have observed that the long source is exceptionally possible when the correlate is in the final position in the antecedent.

The second possible reason is that supplemental fragments may be more island-insensitive than stripping. In the informal surveys I elicited judgments of not only stripping, but also supplemental fragments. The short source is generally available to supplemental fragments, but I did not report those judgments in this squib because there were additional complications with the long source of

[9] Yoshida et al. (2019) actually focused on another evasion strategy called the cleft source, though they mentioned that their evidence would argue against the short source as well. Following Barros et al. (2014), I assume that the cleft source is generally not available to contrastive remnants. Since Yoshida et al.'s examples all have contrastive remnants, I assume the cleft source is not available, and do not discuss it.

supplemental fragments. Since the long source is not directly relevant to the claim of this squib, I left out supplemental fragments altogether to avoid distraction, and instead report some of the judgments here.

In a follow-up survey, I asked the five consultants who could only get the short source of (12) about (25B), the supplemental fragment counterpart to (12).

(25) A: They hired someone who speaks French yesterday.
B: Yeah, and also German.

All five of them accepted (25B), and all of them could get the short source reading (13b), where only one bilingual person was hired. Interestingly, four consultants could also get the long source reading (13a), where two monolinguals were hired. Note that the correlate in (25) *French* is not utterance-final. Thus, when an island is involved, these speakers seemed to find the long source to be more acceptable with supplemental fragments than with stripping. Thus, supplemental fragments may be genuinely island-insensitive, which could also explain Yoshida et al.'s findings.

2.6. Interim summary

Section 2 has shown that evasion strategies, in particular the short source, are available to stripping, and that the short source must be the reason why the stripping examples discussed in this squib appear to be island-insensitive. Since stripping involves the same underlying operations as other types of clausal ellipses such as sluicing and fragment answers, the evasion strategies that are available to stripping should be available to clausal ellipsis more generally.

3. Clausal ellipsis can delete phrases that are smaller than TP

Section 2 argued that clausal ellipsis can take as its antecedent a subpart of the previous sentence, and the short sources discussed in section 2 are all finite TPs. This section argues that this does not have to be the case: the source of clausal ellipsis can be phrases smaller than a finite TP, and therefore, clausal ellipsis can delete phrases smaller than a TP.

Common analysis of clausal ellipsis involves deletion of at least a TP. Take stripping as an example. Depiante (2000) and Merchant (2004) suggest that the remnant of stripping undergoes focus movement, landing in the specifier of FocusP. Then the TP or C' gets deleted. According to Depiante, FocusP is projected above TP. According to Merchant, FocusP is above CP.[10] Following would be their analysis of (26). I call the parse of a stripping sentence where the remnant moves above the finite TP and the finite TP gets deleted *the full-TP source*. Depiante's and Merchant's analyses would thus be the full-TP source analysis of (26).

(26) Pat speaks Wampanoag, but not Passamaquoddy.

(27) *Full-TP source of (26)*
a. Depiante's (2000) analysis of (26)
Pat speaks Wampanoag, but [$_{\text{FocusP}}$ not Passamaquoddy$_i$ [$_{\text{TP}}$ ~~Pat speaks t$_i$~~]].

[10] In fact, Merchant proposed this analysis for English fragment answers, and later suggested that it can be extended to English stripping as well. The landing site of the stripping remnant must land above CP in order to account for the island sensitivity of stripping in Merchant's system.

b. Merchant's (2004) analysis of (26)
Pat speaks Wampanoag, but [$_{FocusP}$ not Passamaquoddy$_i$ [$_{CP}$ [$_{TP}$ ~~Pat speaks t$_i$~~]]].

Subsections 3.1–3.4 will show with four arguments that the full-TP source can't be the only possible analysis of stripping sentences like (26). There must be an additional analysis (what I call *sub-TP source*), where stripping can delete a phrase smaller than a finite TP, in these cases a vP. Under this analysis, (26) would be coordination of two vPs, with movement of the remnant within the second vP followed by deletion of that vP. The subject *Pat* ATB-moves out of the coordinated vPs.

(28) *Sub-TP source of (26)*
Pat [$_{vP}$ speaks Wampanoag], but not Passamaquoddy$_i$ [$_{vP}$ ~~speaks t$_i$~~]].

The logic of the arguments in these subsections follows the logic of section 2. Stripping is the critical case study here because it has unique properties that other types of clausal ellipsis do not have. The fact that stripping occurs in coordination and often co-occurs with elements like negation allows us to diagnose the size of the deleted phrase through the scope of coordination and negation with respect to other elements in the sentence. While this section focuses on stripping, my claims extend to clausal ellipsis more broadly. For example, sluicing seems to be able to delete an infinitival TP instead of a finite TP.

(29) They have not told us when to meet or where [$_{TP}$ ~~to meet~~].

3.1. Argument 1 for the sub-TP source: Scope interactions with a subject quantifier

In this subsection I will argue that the sub-TP source is available by examining simple finite sentences with a subject quantifier such as (30). I will show that the full-TP source and the sub-TP source of (30) lead to different meanings, and argue for the presence of the sub-TP source by showing the presence of its meaning.

(30) No one looked for a serial killer, but not a thief.

The full-TP source of (30) requires deletion of the finite TP, therefore the stripping remnant must move to the edge of the TP, and then the TP gets deleted. The reading of the full-TP source is equivalent to 'no one tried to find a serial killer, but someone tried to find a thief'.

(31) *Full-TP source of (30*)
No one looked for a serial killer, but not [a thief]$_j$ [$_{TP}$ ~~no one looked for t$_j$~~].
Reading: 'No one tried to find a serial killer, but it's not the case that no one tried to find a thief.'

Contrast the full-TP source with the sub-TP source, where the stripping remnant moves to the edge of a phrase that is smaller than a finite TP. For example, a possible sub-TP source is that the remnant moves to the left periphery of the vP, and the vP gets deleted.

(32) *Sub-TP source of (30)*
No one looked for a serial killer, but not [a thief]$_j$ [$_{vP}$ ~~looked for t$_j$~~].
Reading: 'No one satisfies both these conditions: (a) they tried to find a serial killer and (b) they didn't try to find a thief.'

The full-TP source and the sub-TP source lead to different meanings, and (30) doesn't have the meaning corresponding to the full-TP source, but it has the meaning corresponding to the sub-TP source, suggesting that the sub-TP source is available. The reading of the sub-TP source (32) is true if many people tried to find a serial killer, but those people tried to find a thief as well (for example, they wanted to solve a case, and it would require catching both a serial killer and a thief), but the full-TP source reading is not true in this scenario. We can say (30) in this scenario, suggesting that the sub-TP source is available, and the remnant of stripping can land below the TP.

The sub-TP source reading must be derived by ellipsis. An analysis with DP-coordination and no ellipsis at all (No one looked for [$_{ConjP}$ a serial killer but not a thief]) cannot derive the sub-TP source reading. In the sub-TP source reading, the intensional verb *looked for*, which roughly means 'tried to find', occurs twice: 'No one is such that they tried to find a serial killer, and they didn't try to find a thief'. In other words, in this reading what is coordinated is at least two VPs. In order to derive such a reading, the underlying structure should also coordinate at least two VPs, with the second occurrence of the verb being elided. To ensure there is ellipsis, in all the examples in the following subsections, the remnant is the object of an intensional verb.

Recall that section 2 argued for the short source–a finite TP whose subject is an E-type pronoun. We may wonder if that short source could derive the reading in (32), and if it could, then we may not need to propose the sub-TP source here. The short source suggested in section 2 cannot derive this reading because it requires an E-type pronoun, and E-type pronouns cannot refer to non-existent antecedents such as *no one*. That full-TP short source would be 'No one looked for a serial killer, but they did not look for a thief,' which is infelicitous because *they* cannot refer to *no one*.

3.2. Argument 2 for the sub-TP source: Scope interactions with the verbs

Having examined the scope interactions with a subject quantifier in simple finite sentences, this subsection will study sentences that embed a phrase that is smaller than a finite TP (e.g., a gerund or an infinitival TP). If stripping only has the full-TP source, then the remnant must move out of the embedded gerund or infinitival TP because it is too small to host the landing site for the remnant. I will show that these sentences nevertheless have readings where the remnant stays inside the embedded gerund or infinitival TP, supporting the sub-TP source analysis. In the following sentences, the remnant is embedded in a gerund and an infinitival TP respectively.

(33) a. Sherlock admitted to looking for a serial killer, but not a thief.
b. Sherlock pretended to be looking for a serial killer, but not a thief.

Following is the full-TP source of (33):

(34) *Full-TP source of (33)*
a. Sherlock admitted to looking for a serial killer, but not [a thief]$_j$ [$_{TP}$ ~~Sherlock admitted to looking for t$_j$~~].

b. Sherlock pretended to be looking for a serial killer, but not [a thief]$_j$ [$_{TP}$ ~~Sherlock pretended to be looking for t$_j$~~].

Consider (33a) as an example. Its full-TP source has the following meaning: 'Sherlock admitted to looking for a serial killer, but he did not admit to looking for a thief'. Perhaps he did not admit to or deny looking for a thief. But (33a) does not only have this reading, it also has a reading that corresponds to an analysis where the remnant moves to the edge of the embedded gerund, and this gerund gets deleted. This is the sub-TP source.

(35) *Sub-TP source of (33)*
a. Sherlock admitted to looking for a serial killer but not [a thief]$_j$ [$_{vP}$ ~~looking for t$_j$~~]].
b. Sherlock pretended to be looking for a serial killer, but not [a thief]$_j$ [$_{TP}$ ~~to be looking for t$_j$~~].

The sub-TP source of (33a) has the following meaning: 'Sherlock admitted to doing the following: (a) looking for a serial killer; and (b) not looking for a thief.' The following context can highlight this reading: the reporters were spreading the news that Sherlock was an arrogant detective, and was only interested in the difficult crime cases like looking for a serial killer, and did not care about trivial cases like looking for a thief. We can say (33a) to mean that Sherlock confirmed this news. This reading is different from the one of the full-TP source because in the sub-TP source, Sherlock admitted that he was not looking for a thief, but in the full-TP source, Sherlock did not admit that he was looking for a thief, and might not deny it, either. The reader can verify that (33b) has the sub-TP source reading as well.

Because (33a-b) have the sub-TP source reading where a gerund and an infinitival TP get deleted instead of a finite TP, this supports the view that stripping can delete phrases that are smaller than a finite TP.

3.3. Argument 3 for the sub-TP source: Scope interactions with an island

The previous subsection has shown that sentences that embed phrases smaller than TP have both the full-TP source reading and the sub-TP source reading. This subsection sharpens this judgment by blocking the full-TP source reading. The resulting sentence is grammatical, and only has the sub-TP source reading.

I block the full-TP source reading by putting the stripping remnant in an island, and this island is smaller than a TP. For example, in (36a-b) the remnant *a thief* appears in an adjunct island and a complex NP island respectively. These islands contain a gerund and an infinitival TP respectively, and are too small to host a CP or a finite TP.

(36) a. Sherlock had the reputation of being ambitious [$_{AdjunctP}$ due to looking for a serial killer], but not a thief.
b. Everyone was surprised by [$_{Complex\ NP}$ Sherlock's decision to look for a serial killer], but not a thief.

In the full-TP source analysis, the stripping remnant must land above the matrix TP, and would therefore cross an island boundary.

(37) *Full-TP source of (36a-b)*

a. … but not [a thief]$_i$ [$_{TP}$ ~~Sherlock had the reputation of being ambitious [$_{AdjunctP}$ due to looking for t$_i$]~~].

b. … but not a thief$_i$ [$_{TP}$ ~~everyone was surprised by [$_{Complex\ NP}$ John's decision to look for t$_i$]~~]].

In the sub-TP source analysis, the stripping remnant does not need to cross the island. Instead, it can move to the edge of the embedded gerund (38a) or the infinitival TP (38b), and then the gerund and the infinitival TP get deleted:

(38) *Sub-TP source of (36a-b)*

a. Sherlock had the reputation of being ambitious [$_{AdjunctP}$ due to [$_{ConjP}$ looking for a serial killer], but not [a thief]$_i$ [$_{vP}$ ~~looking for t$_i$~~]].

b. Everyone was surprised by [$_{Complex\ NP}$ Sherlock's decision [$_{ConjP}$ to look for a serial killer], but not a thief$_i$ ~~[$_{TP}$ to look for t$_i$]~~].

The full-TP source and the sub-TP source for (36) lead to different meanings, and for some speakers (36) only has the reading that corresponds to the sub-TP source. Take (36a) as an example. Before examining its meaning, let us first look at the fully pronounced versions of the full-TP source and the sub-TP source, and focus only on the part involving *a thief*. They are a minimal pair: the fully pronounced version of the full-TP source puts negation in the matrix clause (39), while the fully pronounced version of the sub-TP source puts negation in the embedded island (40). Following are some possible readings of (39) and (40). Crucially, (39) cannot have the reading of (40), and vice versa.

(39) *Fully pronounced full-TP source*

Sherlock had the reputation of being ambitious due to looking for a serial killer, but Sherlock didn't have the reputation of being ambitious due to looking for a thief.

Available reading: '… Sherlock was looking for a thief, but looking for a thief is not why he had the reputation of being ambitious.'

(40) *Fully pronounced sub-TP source*

Sherlock had the reputation of being ambitious due to looking for a serial killer, but not looking for a thief.

Available reading: '… Sherlock had the reputation of being ambitious because he was not looking for a thief.'

In (39) and (40), negation takes scope at its surface position. (39) and (40) differ in what is negated and what is presupposed by the adjunct: in the possible reading of (39), *due to looking for a thief* is negated, and it is presupposed that Sherlock was looking for a thief, while in (40), *looking for a thief* is negated, and it is presupposed that Sherlock was not looking for a thief. (40) does not have the reading of (39), and vice versa. Assuming that only material in the c-commanding domain of negation can be negated, this suggests that negation takes scope above the adjunct in (39), and takes scope below the adjunct in (40).

Having examined the meaning of the overt versions of the full-TP source and the sub-TP source, let us return to the sentence with ellipsis (36a), repeated below. I added the reading that is available for everyone, and the reading that is unavailable for some speakers:

(36) a. Sherlock had the reputation of being ambitious [$_{\text{AdjunctP}}$ due to looking for a serial killer], but not a thief.
Reading available for everyone: Sherlock had the reputation of being ambitious because of two things: (a) he was looking for a serial killer; and (b) he was not looking for a thief.

Reading unavailable for some speakers: Sherlock had the reputation of being ambitious because he was looking for a serial killer; he did not have the reputation of being ambitious because he was looking for a thief.

In the unavailable reading, Sherlock was both looking for a serial killer and a thief. Looking for a serial killer was the reason why he had the reputation of being ambitious, and looking for a thief was not. The available reading corresponds to the sub-TP source, and the unavailable reading corresponds to the full-TP source. This suggests that the sub-TP source is available to (36a).

I have shown that the full-TP source, which requires the remnant of ellipsis to move across an island, is not available for some speakers. If we can change (36a) minimally, so that the remnant does not move across an island, then the full-TP source reading should be available for everyone, where negation can take scope above the adjunct, and it is presupposed that Sherlock was looking for a thief. We can construct these minimal pairs by replacing the ellipsis remnant in (36a) with a remnant that contains the adjunct island. Consider the following sentence, which does have the matrix scope for negation:

(41) Sherlock had the reputation of being ambitious due to looking for a serial killer, but not due to looking for a thief.
Available reading: Sherlock had the reputation of being ambitious because he was looking for a serial killer; he did not have the reputation of being ambitious because he was looking for a thief.

This sentence has the full-TP source reading because the entire island moves as the ellipsis remnant, and this movement does not cross any island boundary:

(42) … but not [due to looking for a thief]$_i$ [$_{\text{TP}}$ ~~Sherlock had the reputation of being ambitious t_i~~].

3.4. Argument 4 for the sub-TP source: Contradictory and ungrammatical contexts

This subsection takes advantage of the observation in the previous subsection that for some speakers, when the remnant is embedded in a small island, as in (36), the sentence only has the sub-TP source reading. This subsection blocks the sub-TP source with a contradictory context or an ungrammatical context. For these speakers, the elliptical sentences should be bad for these speakers. This prediction is borne out by the following sentences:

(43) a. #The veteran CEO was successful due to having charisma, but not experience.

b. *Due to looking for a serial killer, Sherlock had the reputation of being ambitious, but not a thief.

Example (43a) is infelicitous under the interpretation of *the veteran CEO* as a CEO with a lot of management experience. (43a) is infelicitous because it only has a sub-TP source (the full-TP source is ungrammatical because it involves an island-crossing movement), and the sub-TP source is contradictory: The veteran CEO was successful due to having charisma, but not having experience.[11]

Example (43b) is ungrammatical because the sub-TP source is ungrammatical. The sub-TP source requires a conjunction that is embedded in the adjunct. We cannot move one of the conjuncts out of the adjunct because it would violate the adjunct island and Coordinate Structure Constraint. In the following sentence, a possible sub-TP source parse of (43b), the adjunct has been topicalized. To generate this word order, the second conjunct *but not a thief* has to move rightward out of the adjunct, which is illegal:

(44) *Due to looking for a serial killer t_i, Sherlock had the reputation of being ambitious, [but not [a thief]$_j$ [$_{vP}$ ~~looking for t_j~~]]$_i$.

3.5. Implications for sluicing

I have argued that stripping does not have to delete a full finite TP, but can delete something smaller. Since stripping involves the same syntactic operations as other types of clausal ellipsis, we might expect the other types of clausal ellipsis to also be able to delete a sub-TP. If sluicing can delete a sub-TP, then this can potentially resolve a puzzle about surprising mismatch in sluicing.[12] I briefly describe that puzzle, and show how this analysis, when extended to sluicing, can solve it.

It is generally assumed that in order for ellipsis to occur, there must be an antecedent that is identical to the elided phrase syntactically or semantically. But there are sluicing sentences in the corpus based on a study by UC Santa Cruz Ellipsis Project that seem to violate this identity requirement, whether syntactically or semantically construed. Following are some examples:

(45) a. Sally cooks every night; she learned how ~~to cook~~ from her father.
b. Your favorite plant is alive, but you can never be sure for how long ~~your favorite plant will be alive~~.
c. Sally said that customers should be given lower rates, but Susie said it's hard to see how ~~customers could be given lower rates~~. Rudin (2019:266)

[11] Interestingly, some speakers report that the sentence is okay without *but* and with a lot of prominence on the contrastive foci *charisma* and *experience*:

(i) The veteran CEO was successful due to having CHARISMA, not EXPERIENCE.

Some literature has treated *but* as optional in stripping (e.g. Merchant 2003). In other words, (i) would be considered to involve stripping just as (43a) does. However, the observed contrast between them suggests that they are not the same. I leave to future research exactly what leads to this contrast between sentences with *but* and those without *but*.

[12] I am grateful to Danny Fox and David Pesetsky for suggesting and inspiring this idea.

The elided phrases in (45a-c) mismatch the antecedent in finiteness, tense and modality respectively, but they are fine. Crucially, in the sentences reported by Rudin (2019), all the parts that could have mismatch are elements above VoiceP. If sluicing, like stripping, can delete a sub-TP, say a VoiceP, then perhaps there is no mismatch in (45a-c) after all. Following would be my analysis of (45a-c):

(46) a. Sally cooks every night; she learned how [$_{\text{VoiceP}}$ ~~PRO cook~~] from her father.
b. Your favorite plant is alive, but you can never be sure for how long [$_{\text{VoiceP}}$ ~~your favorite plant be alive~~].
c. Sally said that customers should be given lower rates, but Susie said it's hard to see how [$_{\text{VoiceP}}$ ~~customers be given lower rates~~].

If the elided phrases in (45a-c) are VoiceP, how do they generate readings that seem to have modality? For example, in (45c) there seems to be a modal interpretation of the elided phrase, but according to my analysis, the modal is not present syntactically. I suggest that the context may provide finiteness, tense and modality interpretations to a bare VoiceP. There are cross-linguistic examples that seem to demonstrate this. A simple example is English imperatives, which appear to be sub-TPs but nevertheless have modal interpretations. Another example is bare VoicePs in Haitian Creole, where bare eventives are usually interpreted in the past while bare statives are interpreted in the present.

(1) a. Jan kouri pandan de ze tan.
Jan run for two hour time
'Jan ran for two hours.'

b. Mari konnen Jan.
Mari know Jan
'Mari knows Jan.' (Copley 2014, based on Déchaine 1991)

In future research I want to examine sub-TPs across languages and the range of interpretations they can have, and compare them with the possible interpretations of sub-TPs in ellipsis.

If we want to pursue my analysis of sluicing here, we need to resolve another issue: typically, *wh*-phrases move to Spec, CP in English, presumably in agreement with the interrogative C^0. But how can the *wh*-remnant of sluicing move to Spec, VoiceP in my analysis here? We can ask a variant of this question about the remnant movement in stripping. Depiante (2000) and Merchant (2004) argued that the remnant of stripping undergoes focus movement. If $Focus^0$ is located above C^0 (or on C^0 as a feature, or between TP and CP), how can the remnant of stripping land below that position?

I can think of at least two possible ways to resolve this issue. One is to say that C^0 normally selects for TP, but under ellipsis, this selectional requirement is suspended. In other words, [+Ellipsis] C^0 selects for TP or VoiceP. Everything else is the same as without ellipsis: C^0 has interrogative or focus feature, which triggers movement of the remnant to its edge. Under this assumption, the remnant is actually in Spec, CP, even though I've been saying it is in Spec, VoiceP. Following would be my analysis of (45a) following this assumption:

(47) Sally cooks every night; she learned [$_{\text{CP}}$ how$_i$ C^0 [$_{\text{VoiceP}}$ ~~PRO cook t_i~~]] from her father.

Another possibility is that the remnant of sluicing is in the specifier of a head that is directly above VoiceP, which takes VoiceP as its complement. Let us call this head X^0. Normally, it is C^0 that has the interrogative or focus feature, but a [+Ellipsis] X^0 can have that feature as well. Thus, under ellipsis, the *wh*- or focused remnant can just land in Spec, XP. Verbs like *learned* select for an interrogative phrase, which can be the XP under ellipsis. Following would be my analysis of (45a) following this assumption:

(48) Sally cooks every night; she learned [$_{XP}$ how$_i$ X^0 ~~PRO Voice^0 cook t_i~~] from her father.

4. Conclusion

This appendix has argued that island evasion in clausal ellipsis is an illusion created by the short source. The short source can take as its antecedent a subpart of the previous sentence that does not contain the island. Furthermore, I have argued that stripping does not have to delete a full finite TP. If this is also the case for sluicing, then it could potentially explain apparent mismatch between sluiced content and the antecedent in finiteness, tense and modality: there is actually no mismatch at all, and what appears to be mismatched material is not syntactically present in the elided structure at all.

Appendix B
Double focus does not create prosodic phrasing

1. Introduction

Focus seems to be able to affect prosodic prominence in English: the focused phrase carries nuclear accent, the strongest pitch accent in a phrase; words following the focused phrase are deaccented ('post-focal deaccenting'; Ladd 1980, 1996; de Jong 2004; Xu and Xu 2005). To show what this means, let us first examine a sentence uttered in a neutral context, and then compare its prosody with that of a sentence containing narrow focus. One way to control the position of focus is by making the sentence an answer to a question and changing what the question asks about. For example, when (1B) answers the question in (1A), the entire sentence in (1B) is focused (focus is marked by the subscript F; I will refer to (1B) as having broad focus). In this case, *Gramma*, *bunny*, and *Maryanne* tend to carry pitch accents, as indicated by the high pitch accent H* below.

(1)*Broad focus*
A: What happened?
B: [Gramma gave a bunny to Maryanne]$_F$.
H* H* H*

Compare (1B) with a sentence containing narrow focus. The question in (2A) triggers narrow focus on the direct object, *bunny*, in (2B). The narrow focus is realized by the nuclear accent on *bunny*, and furthermore, there is no pitch accent on any word following *bunny*. Typically, this means that F0 falls sharply after *bunny*, and remains low and level through the rest of the sentence.

(2)*Narrow focus on the direct object*
A: What did Gramma give to Maryanne?
B: Gramma gave a bunny$_F$ to Maryanne.
H* H*

A simple analysis of this phenomenon posits that focus must be marked by a nuclear accent; and given that nuclear accent is defined as the last pitch accent in a phrase, there can be no pitch accent following focus in the phrase. When the entire sentence is focused, as in (1B), we do not observe post-focal deaccenting because nothing follows focus. Regular pitch accent assignment occurs in the focused phrase (the entire sentence in this case), and nuclear accent falls on the last word *Maryanne*. In contrast to (1B), when *bunny* is narrowly focused, as in (2B), *Maryanne* has to be de-accented to ensure that *bunny* is the last pitch-accented phrase in the sentence.

This appendix asks what happens if we put focus on both *bunny* and *Maryanne* (which I call *double focus*), as in (3B). Impressionistically, *bunny* and *Maryanne* both carry pitch accents. This suggests that *bunny* and *Maryanne* may not both have nuclear accents, which violates the requirement that focus be marked by nuclear accent.

(3)*Double focus on the direct object and indirect object*
A: What did Gramma give to whom?
B: Gramma gave a bunny$_F$ to Maryanne$_F$.
H* H* H*

Is there a way to still satisfy the requirement that the focused phrase have nuclear accent in (3B)? We cannot de-accent any phrase here because both *bunny* and *Maryanne* are focused. But prosodic structure not only includes prominence, but also phrasing. Since we cannot de-accent any phrase, we may wonder if focus can alter prosodic phrasing. A possible way to ensure that the focused phrases have nuclear accent is by inserting phrasing. Since nuclear accent is the strongest and last pitch accent in a *phrase*, we could imagine creating two separate prosodic phrases, where *bunny* and *Maryanne* are the last word in each phrase, and thus carry nuclear accent in each phrase. (4) demonstrates a possible way of phrasing.

(4)*Double focus on the direct object and indirect object–phrasing is inserted*
A: What did Gramma give to whom?
B: (Gramma gave a bunny$_F$)(to Maryanne$_F$).
H* H* H*

This added phrase must be strong enough prosodically to be able to have its own nuclear accent. Generally, in a neutral context like (1B), the entire sentence just has one nuclear accent. We may thus consider nuclear accent to be unique to the prosodic domain that matches a sentence, which many theories of syntax-prosody mapping (e.g., Selkirk 1986, 1995) would align to an intonational phrase (ι).

Crucially, if ι-phrasing can be inserted this way like in (4) to ensure focused phrases have nuclear accent, then we would expect the prosodic boundary following *bunny* with double focus (4) to be larger than the boundary following *bunny* with single focus on *bunny* (2) or *Maryanne* (5).

(5)*Narrow focus on the indirect object*
A: Who did Gramma a bunny to?
B: Gramma gave a bunny to Maryanne$_F$.
H* H* H*

This is because with single focus (2) and (5), there is no need to insert additional phrasing after *bunny* to put *bunny* and *Maryanne* into separate ιs. In (2B), *Maryanne* is de-accented to ensure that *bunny*, which is focused, has the nuclear accent of the sentence. In (5), *Maryanne*, which is focused, already has the nuclear accent of the sentence. Assuming that there is a dispreference of inserting additional prosodic phrasing (i.e., a faithfulness constraint in Optimality Theory (*OT*) terms), we would not expect an ι-boundary following *bunny* in (2) and (5) because it would not be necessary, but we might expect an ι-boundary following *bunny* with double focus, as in (3), because that would help put nuclear accents on both foci.

Sections 2–3 present two experimental analyses that test precisely whether this expectation is borne out, which will help answer the research question of whether focus can affect prosodic phrasing. The first analysis is based on the experimental materials collected by Wagner et al. (2010)[1], which consist of ditranstive sentences that vary in double focus or single focus just like (2B), (3B) and (5B). The second analysis relies on an experiment that I conducted and was partly reported in chapter 5. In that experiment, I studied coordinated structures, which vary in putting double focus on each conjunct or single broad focus on the entire conjunction. While the materials

[1] I am grateful to the authors of that paper, Michael Wagner, Mara Breen, Edward Flemming, Stefanie Shattuck-Hufnagel and Edward Gibson, for sharing their materials and data with me.

in these two experiments differ in sentence types, they address the research question by asking whether double focus might create additional prosodic phrasing compared to single focus.

The research question of whether focus can affect prosodic phrasing not only has implications for theories of focus prosody, but it is also relevant to the experiments I presented in chapters 5 and 6. There is a confound in those experiments, which lead to alternative explanations of the experimental results that say that the prosodic phrasing effects I found there were not due to the critical factor (i.e., syntactic structure) as I claimed, but due to the effect of focus on phrasing. To preview the results, in the analyses in this appendix I do not see any indication that focus can affect phrasing as the alternative explanations in chapters 5 and 6 claim, and thus this could help reject those alternative explanations.

1.1. Previous literature on focus prosody and syntax-prosody mapping

Kratzer & Selkirk (2020) had a very similar analysis of focus in English, and would make essentially the same predictions as what I have outlined. They proposed a constraint that requires focus-marked constituents be spelled out as the head of an ι (i.e., the most prominent subconstituent of ι), and they assumed that a syntactic sentence / clause corresponds to an ι. If we further assume that the head of an ι is marked by various prominence effects such as nuclear accent, then this is equivalent to my analysis here. Kratzer & Selkirk would analyze sentences with single focus (2B) and (5B) as a single ι, but they would predict that sentences with double focus (4B) are divided into two separate ιs in order to satisfy their constraint to spell out focus as the head of an ι. They made an informal report that sentences with double focus do not seem to have two separate ιs, and this appendix confirms that impression with experimental results.

Where Kratzer & Selkirk differ from my analysis is how post-focal material loses pitch accents. I assume it is due to post-focal de-accenting, but Kratzer & Selkirk claimed there is no post-focal de-accenting at all, and post-focal material like *Maryanne* in (2B) does not have pitch accent because it is given. This difference does not matter to the discussion in this appendix because the experimental analyses focus on phrasing effects, not prominence effects like pitch-accenting.

I have assumed that a sentence is mapped to an ι, and focused material must be the most prominent element in an ι. But there may not be a category ι at all. For example, as Elfner (2015) suggested, we might entertain a theory that maps all syntactic phrases (XP) to phonological phrases (φ). What was considered to be ι may just be a special type of φ. Section 4 discusses how this alternative view of syntax-prosody mapping may account for the experimental results in this appendix. Section 5 concludes the appendix.

2. Experiment 1: Wagner et al. (2010)

2.1. Materials

The materials in the analysis were collected by Wagner et al. (2010). The target sentences were all ditransitives like (1B), and they varied in two factors: (a) whether the direct object / the indirect object is given and (b) whether the objects associate with a focus-sensitive operator like *only*. There were six types of items in Wagner et al.'s experiment, but for our purposes, I collapse them into three conditions. In the first condition "double focus" (which combines Wagner et al.'s conditions 2, 4, 5 and 6), both the direct object and the indirect object are focused (6a), but they may associate with different focus-sensitive operators: they may associate with *only* or be

contrastively focused. In the second condition "single focus on direct object" (which corresponds to Wagner et al.'s condition 1), only the direct object is focused, and it associates with *only* (6b). In the third condition "single focus on indirect object" (which corresponds to Wagner et al.'s condition 3), only the indirect object is focused, and it associates with *only* (6c).

Condition	**Target sentence**
Double focus	(6a) Gramma only gave a bunny$_F$ to Maryanne$_F$.
Single focus on direct object	(6b) Gramma only gave a bunny$_F$ to Maryanne.
Single focus on indirect object	(6c) Gramma only gave a bunny to Maryanne$_F$.

Each target sentence follows a story and a set-up sentence to elicit the desired information structure. For example, following is the complete context for (6b) that was presented to the speakers.

(7)*Story*: It was Christmas, and Gramma was deciding what gifts to give to her grandchildren, John and Maryanne. She had knitted two scarves as gifts, and had also purchased a couple of stuffed bunnies. She wrapped up a scarf and a bunny for John. Then she remembered how rude Maryanne had been at Thanksgiving.
Set-up: Gramma didn't give a scarf to Maryanne.
Target: Gramma only gave a bunny$_F$ to Maryanne.

There were ten sets of items and ten pairs of participants. In each set of items, the "double focus" condition consists of four different story-setup-target trios, and the single focus conditions each consists of one trio. There were a total of 60 trios. I refer the reader to Wagner et al. (2010) for all ten sets of items.

I focus on the prosodic boundary following *bunny*, and compare this boundary under double focus with the boundary under single focus. If focused phrase must be the head of an ι, and prosodic phrasing can be altered to satisfy that, then we would expect the boundary in (6a) to be stronger than in (6b-c). If focused phrase doesn't have to be the head of an ι, then the boundary in (6a) would not be significantly different from the boundary in (6b-c).

2.2. Data annotation and critical measure

Since the materials were collected by Wagner et al. (2010), I do not repeat exactly who were the participants and how they were collected, and refer the reader to their paper for these details.

I annotated the materials using Montreal Forced Aligner (McAuliffe et al. 2017) with acoustic models trained on LibriSpeech (Panayotov et al. 2015). Montreal Forced Aligner labeled the last rime of the word immediately before the prosodic boundary of interest (i.e., the last rime of the direct object; for (6a-c), *y* of *bunny*). I chose this durational measure because as Wightman et al. (1992) showed, the final rime of a word is lengthened before a phrase boundary, and the stronger / larger this boundary, the longer the rime. Thus, the duration of the last rime of *bunny* in (6a-c) is correlated with the strength of the prosodic boundary following *bunny*.

2.3. Data analysis

I fitted a linear mixed effects model, with the duration of the last rime as the dependent, and condition (double focus vs. single focus on direct object vs. single focus on indirect object) as fixed effects. I calculated p-values using using Satterthwaite's degrees of freedom method. The models only included random intercepts by speaker and item group because inclusion of their random slopes resulted in a singular fit.

2.4. Results

The final rime of the direct object does not differ significantly between the double focus condition and the single focus on direct object condition; there is also no significant difference between the double focus condition and the single focus on indirect object condition.

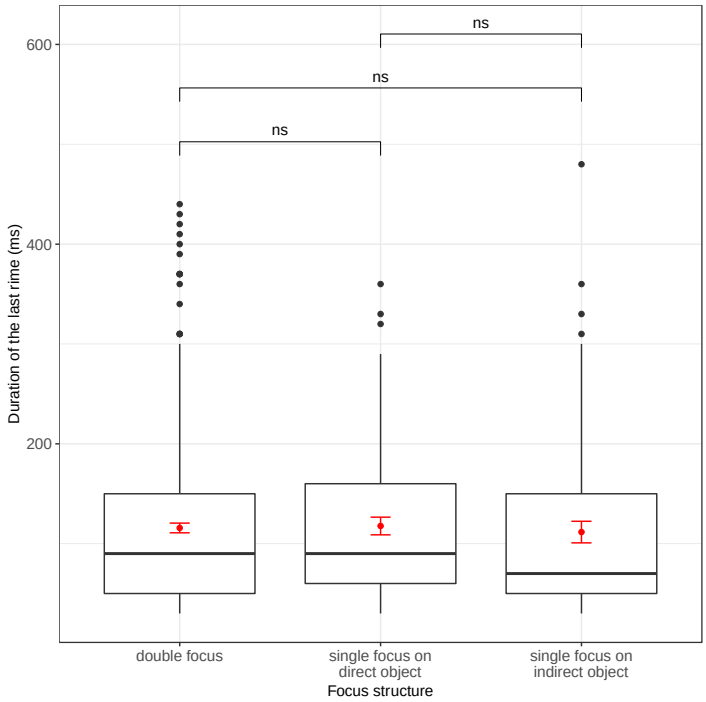


Figure 1: *Duration of the final rime of the direct object.*

2.5. Discussion

There is no significant difference in the size of the prosodic boundary between conditions. There is no evidence that sentences with double focus are divided into two significant prosodic domains (e.g., two ɪs). If sentences with double focus are a single ɪ, then focused material may not have to be the most prominent element in a prosodic phrase (e.g., head of ɪ), and no ɪ-boundary is inserted to make sure of this.

3. Experiment 2: Fragment answers in coordination

In chapter 5, I presented an experimental study of the prosodic effects of ellipsis in coordination, but there was a confound with the focus structure of the materials. To control for that confound, I ran and presented a follow-up experiment that studied the same question, but varied the focus structure of the materials in a systematic way. That follow-up experiment was not only designed to study the prosodic effects of ellipsis, but also the research question in this appendix: whether focus can affect prosodic phrasing. This section presents that follow-up study.

3.1. Materials and predictions

The materials consisted of 30 target sentences in 5 sets, which vary by coordination types (DP coordination vs. clausal coordination), focus structures (double focus vs. single focus) and what I called in chapter 5 *condition types* (critical condition vs. control condition). There are two cells missing in this 2x2x2 design: clausal coordination has to involve double focus, and can't have single focus. Each target sentence was shown to the speakers along with a leading context sentence and a *wh*-question to elicit the intended information structure in the target sentence. The speaker was to read the context silently, and say the question and the answer in the given order. All 5 sets of items are presented in section 8.2 of chapter 5.

	Double focus	**Single focus**
Clausal coordination	(8a) *Critical Condition* Context: Loretta went on a road trip. Q: Where did Loretta go and when? A: McDonald's$_F$ and on Sunday$_F$.	
	(8b) *Control Condition* Context: Loretta went on a road trip. Q: Where did Loretta go and when? A: She went to McDonald's$_F$ and on Sunday$_F$.	
DP coordination	(8c) *Critical Condition* Context: Loretta went on a road trip. Q: Which restaurant and which giftshop did Loretta go to? A: McDonald's$_F$ and Walt Disney$_F$.	(8e) *Critical Condition* Context: Loretta went on a road trip. Q: Where did Loretta go? A: [McDonald's and Walt Disney]$_F$.
	(8d) *Control Condition* Context: Loretta went on a road trip. Q: Which restaurant and which giftshop did Loretta go to? A: She went to McDonald's$_F$ and Walt Disney$_F$.	(8f) *Control Condition* Context: Loretta went on a road trip. Q: Where did Loretta go? A: She went to [McDonald's and Walt Disney]$_F$.

Because of the missing cells in clausal coordination, the analysis in this appendix focuses on the bottom four cells in DP coordination (8c-f) in a 2x2 design. The critical difference is the difference between double focus, where each conjunct carries separate focus, and single focus, where the entire conjunction carries focus. Just like in ditransitives, in the target sentences with double focus (8c-d), the focused phrases can't be the head of an ι, unless the sentences are divided into two separate ιs. If they were divided into two ιs, we would expect a large prosodic boundary following *McDonald's* in (8c-d). In contrast, the target sentences with single focus (8e-f) do not need to insert an additional ι-boundary because the focused phrase, which is the conjunction phrase, is already the most prominent element in the sentence. Thus, if focused material must be the head of an ι, and prosodic phrasing can be altered to satisfy that, then we would expect the boundary following *McDonald's* with double focus (8c-d) to be stronger than the boundary in (8e-f). If focused phrase doesn't have to be the head of an ι, then the boundary in (8e-f) would not be significantly different from the boundary in (8c-d). In this 2x2 design (8c-f), the difference between Control Condition and Critical Condition and its interaction with focus type are not directly relevant to the research question in this appendix.

3.2. Participants and data collection

I conducted a production study with three native speakers of North American English, who were all graduate students at MIT.

Recording took place in a sound-attenuated booth in the Linguistics Department of MIT. Participants were seated in front of a computer, which displayed one context-question-answer trio at a time. The stimuli were presented in random order, so minimal pairs were not placed next to each other. Participants were given instructions about the task at the beginning of the experiment, and time to read quietly before reading out loud each trio. They were encouraged to act out the dialogues naturally rather than reading mechanically.

3.3. Data analysis

I labelled manually in Praat the last rime of the last word before *and* (e.g., for (8c-f), *ald's* of *McDonald's*) and the pause after that word, if there is a pause. When labeling the rimes, I relied on cues to segmental boundaries. For example, the criterion for the end of *McDonald's* is the end of frication noise.

Then I fitted two mixed effects models, with the duration of the last rime and the sum of the duration of the last rime and the duration of the pause as the dependent variable in each model, and focus (double vs. single) and condition (critical vs. control) as fixed effects. I calculated p-values using using Satterthwaite's degrees of freedom method. The models included random intercepts and slopes by speaker and item group where those effects didn't result in a singular fit.

3.4. Results

There is no significant difference between double-focus sentences and single-focus sentences for the duration of the rime or the sum of the rime duration and the pause duration. There is also no significant difference between Critical Condition and Control Condition for both durational measures, and no significant interaction.

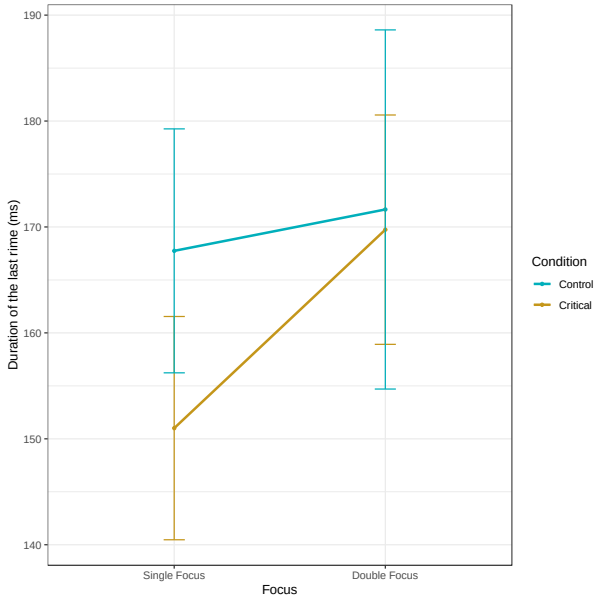


Figure 2: *Duration of the final rime before* and.

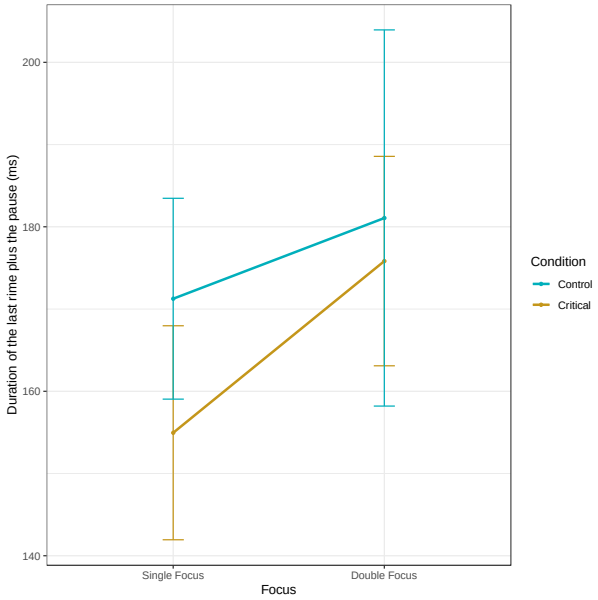


Figure 3: *Duration of the final rime plus the pause before* and.

3.5. Discussion

There is no evidence that the prosodic boundary under double focus is stronger than under single, broad focus. This suggests that prosodic phrasing may not be inserted to make focused material the most prominent element in the prosodic domain. Thus, at least under double focus, the focused phrases may not be the most prominent element in the prosodic domain.

4. Alternative theories that do not posit the ι category

So far in this appendix I have assumed that the focused phrase must be the most prominent element in a certain prosodic domain (i.e., head of a phrase), and the head of this prosodic domain is marked by nuclear accent. I have called this prosodic domain ι, and assumed that if we create two ιs in an utterance, then technically we can accommodate two separate foci, with each focus being the head of an ι. Under these assumptions, the lack of evidence for two separate ιs under double focus suggests that focus doesn't have to always be the head of an ι. Using OT-terms, perhaps the requirement that focus be the head of an ι is dominated by the ban against creating additional ιs.

This section discusses a different view of the prosodic structure, and shows that the experimental results in this appendix may follow naturally from those different assumptions about the prosodic structure. If we adopt a mapping theory that maps syntactic XPs to phonological phrases (φ) and furthermore allows recursive φs (e.g., Match Theory, Elfner 2015), then we may not need to posit a separate prosodic category ι at all. What used to be ι may just be a maximal φ (i.e., the φ that is not dominated by another φ). What used to be the requirement that focus be the head of an ι may now be: focus must be the head of the maximal φ.

If this is the requirement, then under double focus, it may not help to insert a phrase boundary anyway. Take the double focus sentence (3B) as an example. Following is the prosodic structure Match Theory would assign to (3B) (for simplicity I only marked the relevant φs, and left out the ωs):

(9)((Gramma)$_{\varphi}$ (gave (a bunny$_{F}$)$_{\varphi}$ (to (Maryanne$_{F}$)$_{\varphi}$)$_{\varphi}$)$_{\varphi}$)$_{\varphi}$.

There is only one maximal φ, which includes the entire sentence. Adding additional φs to this structure does not change that fact. Thus, adding additional φs cannot satisfy the requirement that each focus be the head of a maximal φ. This may be why I did not find evidence of additional phrasing with double focus.

5. Conclusion

This appendix has shown with two experiments that there is no evidence that in English, there is more prosodic structure under double focus than under single focus. Assuming that focused material must be the head of a prosodic domain, and that this domain is an ι, then the experimental results suggest that focused material doesn't always have to be the head of an ι. When there is tension between making focus the head of an ι and creating additional ιs, English chooses the latter over the former. But if we assume there is no ι category at all, and focused material just needs to be the head of a maximal φ, then the experimental results follow naturally: there is no way to create a prosodic structure with double focus such that each focus is the head of a maximal φ, thus the grammar gives up and has to tolerate foci which are not the head of a maximal φ.

Appendix C
Prosody of *either…or…* sentences

1. Introduction

Chapter 6 has provided evidence from a prosodic experiment for a syntactic analysis of corrective *but* sentences that involves ellipsis. Furthermore, the results of that prosodic experiment suggest that the prosodic structure of English coordination replicates the recursive dominance relations of the syntactic structure.

This appendix presents an experimental investigation of the prosody of *either…or…* sentences that essentially tries to replicate the prosodic experiment on corrective *but* sentences in chapter 6. The prosodic experiment on *either…or…* sentences tries to address two separate research questions: (a) what the correct syntactic analysis of *either…or…* sentences is (i.e., drawing evidence from prosody for syntactic arguments); and (b) what sorts of syntactic phrases are mapped onto the prosodic structure. *Either…or…* coordination has recursive syntactic structure, which leads me to ask if the prosodic structure replicates those layers of syntactic structures, or perhaps flattens them. Take the sentence *Lillian either will look for Beatrice or David* as an example, there is independent syntactic-semantic evidence that it has the following syntactic structure: Lillian either [$_{T'}$ will [$_{vP}$ look [$_{PP}$ for [$_{DP}$ Beatrice]]]] or David, where *Beatrice* is deeply embedded by many levels of XP and X'. I ask whether prosodically, *Beatrice* is also so deeply embedded. This question is interesting because theories of syntax-prosody mapping differ in how recursive prosodic structure can be. Some claim that the prosodic structure can replicate the recursiveness of the syntactic structure completely, some others claim that it only can replicate it partially, while others claim that it is much flatter than the syntactic structure. *Either…or…* sentences provide a great place to study this question because their unique syntactic structure allows us to vary the degree of syntactic embedding of *Beatrice* gradiently and systematically, and see if the prosodic structure may vary accordingly.

This appendix will present an experiment on *either…or…*, whose results are surprising in that neither of the competing syntactic analyses of *either…or…* can predict them, no matter what assumptions we make about the mapping from syntax to prosody. This suggests that there is something we do not yet understand about the syntax-prosody mapping and perhaps the unique prosodic properties of *either…or…* sentences. Still, I want to present the results for future research.

The experiment (and also the other experiments presented in this dissertation) take advantage of an empirical generalization about English coordination that has been tested experimentally (e.g., Wagner 2005, 2010) and confirmed experimentally by this dissertation: coordination of clauses has different prosody from coordination of DPs. Specifically, the coordinated clause is followed by a larger *prosodic boundary* than the coordinated DP. For example, (1a) is coordination of two TPs, while (1b) can involve coordination of two DPs.

(1)a. [$_{TP}$ Lillian will look for Beatrice] or [$_{TP}$ she will look for David].
b. Lillian will look for [$_{DP}$ Beatrice] or [$_{DP}$ David] this Saturday.

This difference in syntactic structure is reflected in their prosody: *Beatrice* in (1a) is followed by a larger prosodic boundary than *Beatrice* in (1b). The experiment in this appendix takes advantage of this empirical observation, and uses it to adjudicate between two different syntactic analyses of *either…or…*. One syntactic analysis posits that some *either…or…* sentences involve coordination

of two clauses, while the other analysis posits coordination of two DPs for these sentences. Since coordination of clauses has different prosody from coordination of DPs, these two syntactic analyses should make different prosodic predictions.

While the literature has demonstrated that clausal coordination has a different prosody from DP-coordination, there has been no work to my knowledge that asks whether coordination of various subclauses may have different prosodic realizations. For example, it is not clear whether coordinated T-bar (2a), coordinated VP (2b), and coordinated DP (2c) may have different prosodic boundaries, which may be realized as different boundaries following the word *Beatrice*.

(2)a. [$_{T'}$ Lillian will look for Beatrice] or [$_{T'}$ has looked for David].
b. Lillian will [$_{VP}$ look for Beatrice] or [$_{VP}$ hide from David].
c. Lillian will look for [$_{DP}$ Beatrice] or [$_{DP}$ David].

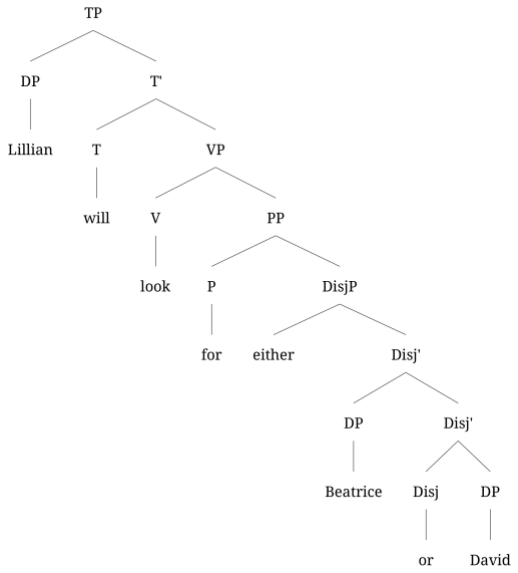
A comparison of (2a-c) would allow us to understand the important question of what kinds of syntactic phrases are mapped onto the prosodic structure, and specifically, whether the syntax-prosody mapping process distinguishes between various subclauses. Different theories of syntax-prosody mapping have different predictions about this question. Some predict that all subclauses should be mapped to the same prosodic phrase (i.e., *Beatrice* should be followed by the same prosodic boundary in (2a-c)), others claim that the mapping process ignores non-maximal projections (i.e., a two-way difference in prosody, between (2a) and (2b-c)), and others predict that the mapping process only cares about the syntactic levels of embedding, and does not care whether the phrase is a clause, subclause, maximal or non-maximal projection (i.e., a three-way difference among (2a-c)).

But (2a-c) are not ideal sentences to test this question because they differ in the length of overall material, which has been shown to affect prosody (e.g., Gee & Grosjean 1983; Jun 2000, 2003; Selkirk 2000; Watson & Gibson 2005). This appendix avoids this issue by taking advantage of the syntactic analysis of *either…or…* sentences. These sentences allow us to vary the size of coordination paradigmatically while controlling for the length of material, thus providing us a clean way to test the question of what sorts of subclause are mapped onto prosody. For example, I study *either…or…* sentences such as (3).

(3)Lillian will look for either Beatrice or David.

In *either…or…* sentences, *either* always co-occurs with *or*, which we might take to indicate that *either* selects for the *or*-phrase, and therefore *either* must be the sister of the *or*-phrase, or what we call the *Disjunction Phrase (DisjP)*. This has indeed been a common analysis of *either…or…* sentences in the literature (e.g. Sag et al. 1985).

(4)Lillian will look for either [$_{DisjP}$ Beatrice or David].

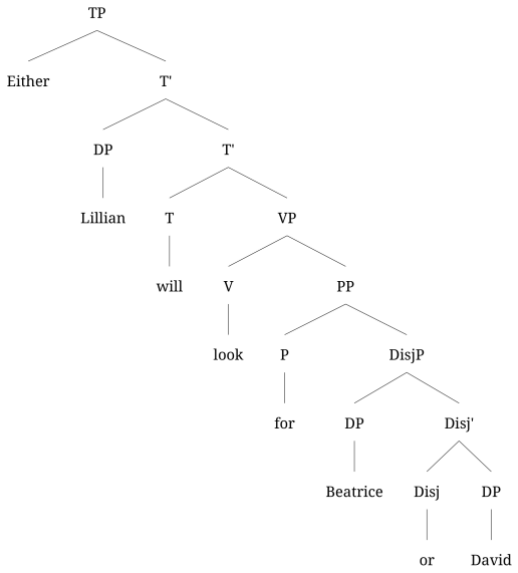


Instead of appearing adjacent to the DisjP *Beatrice or David*, *either* in (5) appears far to the left of that position.

(5)a. Lillian will either look for Beatrice or David.
b. Lillian either will look for Beatrice or David.
c. Either Lillian will look for Beatrice or David.

Syntactic theories analyze *either* far to the left as *either* being structurally higher than the sister of DisjP. This is represented in the following tree structure for (5c):

(6)



Because *either* here is structurally higher than the sister of disjunction, I will call sentences like (5) *either-seems-high*, to indicate that *either* seems higher than the sister of DisjP.

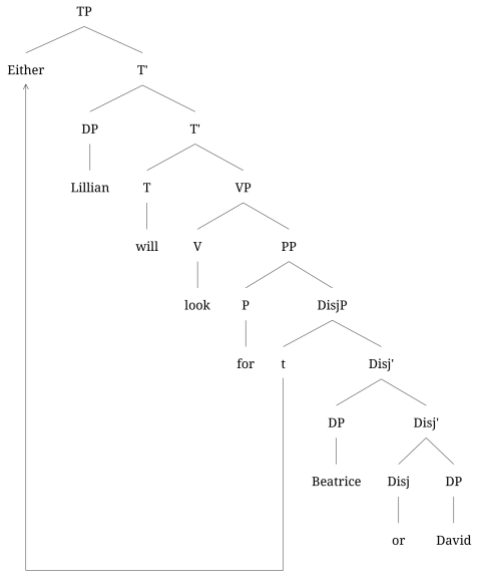
Either can also appear to be embedded inside the first disjunct, structurally lower than the sister of DisjP (7). I call sentences like (7) *either-seems-low*. (7a-c) are uncontroversially clausal coordination.[1]

(7)a. Lillian will either look for Beatrice or she will look for David.
b. Lillian either will look for Beatrice or she will look for David.
c. Either Lillian will look for Beatrice or she will look for David.

I will now present two competing syntactic analyses for *either*-seems-high sentences, and then provide experimental evidence for one of them. Both analyses follow the intuition that *either* must be the sister of disjunction, but they differ in the precise implementation of this idea. The first analysis is what I call the *movement-based account* (Larson (1985) and Johannessen (2005)): *either* originates as the sister of disjunction, and then moves to its surface position. Following would be their analysis of (5c) and the analysis in tree structure:

(8)Either$_i$ Lillian will look for t$_i$ [$_{DisjP}$ Beatrice or David].

(9)



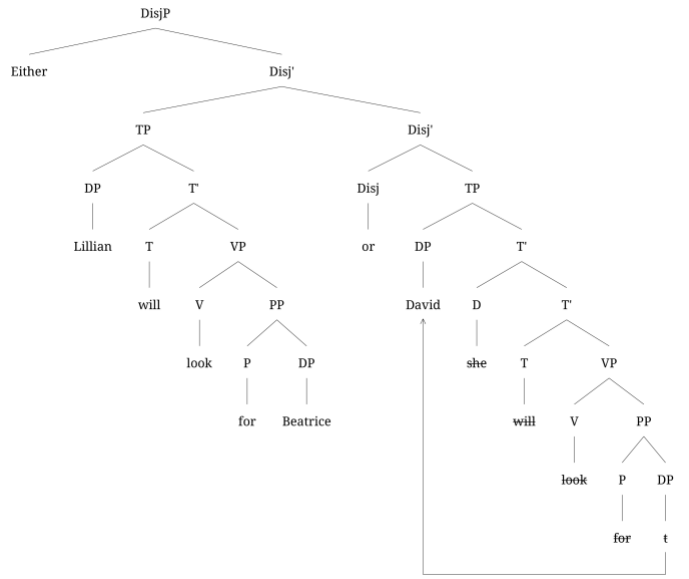
The second analysis differs in claiming that *either* is always the sister of DisjP. *Either*-seems-high is an illusion created by ellipsis (I call this the *ellipsis-based account*; Schwarz 1999; Han & Romero 2004; chapter 2 of this dissertation). When *either* seems too high, ellipsis has applied in the noninitial disjuncts, making the DisjP seem smaller than it actually is, and making *either* seem higher than it actually is. I assume that this ellipsis involves movement of the remnant *David*, the

[1] I provide a syntactic analysis of these *either*-seems-low sentences in chapter 2, but I do not discuss it in detail here because it is not directly relevant to the experiments. In chapter 2 I argue that these sentences involve clausal disjunction: *either* originates in the position it surfaces in, and then moves covertly to the left edge of disjunction and be adjacent to it.

phrase that survives ellipsis, out of the ellipsis site plus deletion of a phrase. Following would be their analysis of (5c) and the analysis in tree structure:

(10) Either [$_{DisjP}$ Lillian will look for Beatrice or David$_i$ ~~she will look for t$_i$~~].

(11)



A key difference between the movement-based account and the ellipsis-based account is that the former posits coordination of two DPs, but the latter posits coordination of two clauses. Following previous experimental results that the coordinated clause is followed by a larger prosodic boundary than the coordinated DP, the movement-based account predicts that *Beatrice* is followed by a prosodic boundary corresponding to a coordinated DP, while the ellipsis-based account predicts that *Beatrice* is followed by a prosodic boundary corresponding to a coordinated clause. In other words, the movement-based account predicts a smaller prosodic boundary following *Beatrice* than the ellipsis-based account.

But we cannot directly compare the prediction by one theory with the prediction by the other. Instead, we can test which theory makes the right predictions by comparing a larger paradigm of sentences. The following four sentences are the key test items for my experiments:

(12) a. Lillian will look for **either** Beatrice or David.
b. Lillian will **either** look for Beatrice or David.
c. Lillian **either** will look for Beatrice or David.
d. **Either** Lillian will look for Beatrice or David.

The two accounts would make different syntactic analyses of (12a-d). The movement-based account would analyze them all as DP-coordination, but *either* has moved to different positions along the clausal spine.

(13) Syntactic analysis of (12a-d) by the movement-based account:
a. Lillian will look for **either** [Beatrice] or [David].
b. Lillian will **either**$_i$ look for t_i [Beatrice] or [David].
c. Lillian **either**$_i$ will look for t_i [Beatrice] or [David].
d. **Either**$_i$ Lillian will look for t_i [Beatrice] or [David].

In contrast, the ellipsis-based account would analyze them as coordination of different phrases: coordination of DPs (14a), VPs (14b), T-bars (14c), and TPs (14d).

(14) Syntactic analysis of (12a-d) by the ellipsis-based account:
a. Lillian will look for **either** [Beatrice] or [David].
b. Lillian will **either** [look for Beatrice] or [David$_i$ ~~look for t_i~~].
c. Lillian **either** [will look for Beatrice] or [David$_i$ ~~will~~ ~~look for t_i~~].
d. **Either** [Lillian will look for Beatrice] or [David$_i$ ~~she will~~ ~~look for t_i~~].

These different syntactic analyses have different prosodic consequences. Because the movement-based account posits DP-coordination for (12a-d), it predicts that *Beatrice* should be followed by the same prosodic boundary for (12a-d), assuming that this prosodic boundary is only affected by the coordination size.

In contrast, according to the ellipsis-based account, the coordination size increases gradually from (12a) to (12d), from DP-coordination to clausal coordination. Following Wanger's (2005, 2010) finding that a coordinated clause ends with a larger prosodic boundary than a coordinated DP, the ellipsis-based account predicts that at least (12a&d) should differ in their prosodic realizations, specifically, the boundary after *Beatrice* should be greater in (12d) than in (12a) because in (12d), that boundary corresponds to the boundary of a coordinated clause, but in (12a), that boundary corresponds to that of a coordinated DP.

Therefore, a comparison between (12a&d) would help answer the first research question (i.e., which is the correct syntactic analysis of *either*-seems-high). The movement-based account predicts no significant difference in prosody between (12a&d), while the ellipsis-based account predicts a significant prosodic difference between them.

There are many different theories on syntax-prosody mapping (e.g., edge-based theory (Selkirk 1986, 1995 and others); Align and Wrap constraints (Truckenbrodt 1995, 1999); Match Theory (Selkirk 2009, 2011; Elfner 2012, 2015; Bennett et al. 2015; Ito & Mester 2013, 2015 and others); embedding-based mapping (Wagner 2010). They can all capture the prosodic difference between DP-coordination and clausal coordination. What they differ in is how various subclauses (e.g., DP and VP) and non-maximal projections (e.g., T-bar) are mapped onto prosody. This is the second research question that this experiment wants to address (i.e., what sorts of syntactic phrases are mapped onto prosody). If the ellipsis-based account is the correct syntactic analysis (which has been supported by syntactic-semantic evidence in chapter 2), then (12a-c) are great places to answer the second research question because according to the ellipsis-based account, they involve coordination of DPs, VPs and T-bars respectively.

I discuss each theory on syntax-prosody mapping briefly and their predictions for (12a-c). The edge-based theory aligns edges of syntactic subclauses (i.e., DP and VP in our case) and clauses (i.e., TP) to edges of prosodic constituents, and ignores non-maximal projections. Assuming that English aligns the right edge of DP and VP to the right edge of a phonological phrase (φ), and the right edge of TP to the right edge of an intonational phrase (ι), the prosodic boundary following

Beatrice would be the same (i.e., a φ-boundary for (12a-c)), but that boundary would be much larger for (12d) (i.e., an ι-boundary).

(15) Prosodic structure (12a-d) assigned by the edge-based theory, if the ellipsis-based account is correct:
a. Lillian will look for **either** Beatrice)$_{φ}$ or [David].
b. Lillian will **either** look for Beatrice)$_{φ}$ or [David$_i$ ~~look for t$_i$~~].
c. Lillian **either** will look for Beatrice)$_{φ}$ or [David$_i$ ~~will look for t$_i$~~].
d. **Either** Lillian will look for Beatrice)$_{ι}$ or [David$_i$ ~~she will look for t$_i$~~].

The boundary is the same for (12a-c) because it does not allow recursive prosodic structure (e.g., a φ cannot dominate another φ). Therefore, in (12b), the right edge of the VP (*look for Beatrice*) coincides with the right edge of the DP (*Beatrice*), but there is only a single φ-boundary.

Elfner's version of Match Theory matches syntactic maximal projections to phonological phrases (φ), and ignores non-maximal projections.[2] It differs from the edge-based theory in allowing recursive prosodic structure. Below I mark the key φs assigned by Match Theory (the φs that match the DP *Beatrice*, the VP and the TP):

(16) Prosodic structure (12a-d) assigned by Elfner's Match Theory, if the ellipsis-based account is correct:
a. Lillian will (look for **either** (Beatrice)$_{φ}$ or David)$_{φ}$.
b. Lillian will **either** (look for (Beatrice)$_{φ}$)$_{φ}$ or David.
c. (Lillian **either** will (look for (Beatrice)$_{φ}$)$_{φ}$ or David)$_{φ}$.
d. **Either** (Lillian will look for (Beatrice)$_{φ}$)$_{φ}$)$_{φ}$ or David.

If we add an assumption to Match Theory that requires boundary strength to correlate with the levels of embedding (see section 1.1 of chapter 5 for a detailed discussion of this assumption), then Match Theory would predict that the prosodic boundary following *Beatrice* is the weakest for (12a), medium for (12b&c) and the strongest for (12d).

Wagner's theory has very similar consequences to Match Theory, except that it does not care about the syntactic label of phrases, but only cares about the syntactic level of embedding. While it does not discuss non-maximal projections specifically, we might infer that the T-bar could correspond to a stronger boundary than the VP that it contains, just because the T-bar is less syntactically embedded than the VP. If this is the case, then Wagner's theory would predict a four-way prosodic difference among (12a-c), where the prosodic boundary increases progressively from (12a) to (12d).

Thus, (12a&d) shed light on the first research question: the movement-based theory predicts that the boundary following *Beatrice* should be the same for them, but the ellipsis-based theory predicts a larger boundary for (12d) than (12a). (12a-d) shed light on the second research question: the edge-based theory predicts a two-way difference between (12a-c) and (12d); Elfner's Match Theory predicts a three-way difference among (12a), (12b-c) and (12d); Wagner predicts a four-difference, where the prosodic boundary increases progressively from (12a) to (12d).

[2] Elfner also mentioned that perhaps we don't need ι as a separate category, thus I do not include it in the prosodic structure in (16d). But whether the TP in (16d) is mapped to a level-3 φ or an ι does not matter to us here because it would be a stronger prosodic phrase than the phrases mapped from the T-bar, VP and DP.

2. The experiment

2.1. Materials

The materials of the experiment consisted of 70 target sentences in 10 sets, which vary by *either*'s positions (pre-DP, pre-VP, pre-T-bar (*pre-T'*) and pre-TP) and conditions (Critical vs. Control). The following table shows an example set of items, and all 10 sets of items are presented in Section 4:

***Either*'s position**	**Critical Condition**	**Control Condition**
Before DP	(17a) Lillian will look for **either** Beatrice or David, but she doesn't care who she will find.	
Before VP	(17b) Lillian will **either** look for Beatrice or David, but she hasn't decided which thing she will do.	(18a) Lillian will **either** look for Beatrice or she will look for David, but I don't know which will happen.
Before T-bar	(17c) Lillian **either** will look for Beatrice or David, but she hasn't decided which thing she will do.	(18b) Lillian **either** will look for Beatrice or she will look for David, but I don't know which will happen.
Before TP	(17d) **Either** Lillian will look for Beatrice or David, but I don't know which will happen.	(18c) **Either** Lillian will look for Beatrice or she will look for David, but I don't know which will happen.

The Critical Condition included sentences like (12a-d) plus a *but*-clause. In chapter 2, I show that (12a) is ambiguous, and argue that some of its readings correspond to a larger coordination than what it appears to be on the surface. I added the *but*-clause for disambiguation: to focus on the reading of (12a) that corresponds to DP-coordination. To be consistent, every target sentence is followed by a *but*-clause, even though the other sentences are not ambiguous.

Because the sentences in the Critical Condition vary in both the surface position of *either* and the underlying coordination size according to the ellipsis-based account, I included the Control Condition (18a-c) as a sanity check to make sure that any effect I might find in the Critical Condition is not just due to the surface positioning of *either*. The Control Condition varied the surface position of *either*, just like in the Critical Condition, but it kept the coordination size constant as clausal coordination. Note, however, that whereas I had four possible positions for *either* in the Critical Condition, only three positions were included in the Control Condition, because the DP-initial position is ill-formed in English (see footnote 28 in chapter 2 for speculation of why this may be). There were 52 filler items.

Because of the missing cell in the Control Condition, my analysis will have a crossed 2x3 design and focus on (17b-d) and (18a-c). I also did supplemental analyses of just the Critical Condition (17a-d), which I will also report.

2.2. Participants

I conducted a production study with 20 native speakers of North American English, who were recruited on the MIT mailing lists. They were remunerated a small sum for their time, and granted their written consent to being tested.

2.3. Data collection

Recording took place in a sound-attenuated booth in the Linguistics Department of MIT. Participants were seated in front of a computer, which displayed one item at a time. The stimuli plus fillers were presented in a pseudo-randomized order, so minimal pairs were not placed next to each other. Participants were given instructions about the task at the beginning of the experiment, and time to read silently before saying out loud each item. They were encouraged to act out the dialogues naturally rather than reading mechanically.

2.4. Data annotation and critical measures

I annotated the materials using Montreal Forced Aligner (McAuliffe et al. 2017) with acoustic models trained on LibriSpeech (Panayotov et al. 2015). Montreal Forced Aligner labeled three segments: (a) the last rime of the word immediately before the prosodic boundary of interest (e.g., the last rime of *Beatrice* for (17a-d) and (18a-c)); (b) glottalization or silence between the last word and *or*, if it exists (which I call *filled pause*, e.g., the filled pause between *Beatrice* and *or* in (17a-d) and (18a-c)); and (c) *or*.

I had three durational measures, all of which are correlated with the prosodic boundary following *Beatrice* and/or the boundary before *or*, using (17a-d) and (18a-c) as examples. The first durational measure is the duration of the last rime, which reflects the strength of the boundary following *Beatrice* (e.g., in (19), the measured duration is underlined, and the boundary it reflects is in bold). As Wightman et al. (1992) have shown, the last rime before a phrase boundary reflects the size of the break, and the larger the break, the longer this rime.

(19) Lillian will look for either Beatr<u>ice</u>**)** or David.

The second measure is the duration of the filled pause, which reflects the size of the boundary following *Beatrice* and the boundary before *or* because this filled pause is associated with three different effects, which are explained in detail below.

(20) Lillian will look for either Beatrice**)** <u><filled pause></u> **(**or David.

First, the presence of a filled pause could indicate a large boundary after *Beatrice* because a strong prosodic domain is more likely to have a phrase-final pause than a weak prosodic domain (e.g., an intonational phrase is more likely to end with a pause than a phonological phrase). Second, the presence of a pause with glottalization could indicate a large boundary before *or* because it has been shown that a strong prosodic domain is more likely to induce phrase-initial glottalization than a weak prosodic domain (e.g., an intonational phrase is more likely to begin with glottalization than a phonological phrase; Pierrehumbert & Talkin (1992); Dilley et al. (1996)). Finally, the presence of glottalization could indicate that *or* has a pitch accent and is therefore prominent in its

phrase. This is because speakers sometimes insert a glottal stop before a pitch-accented vowel-initial word. Assuming that *or* is more prominent when it begins a strong phrase than a weak phrase (e.g., an intonational phrase-initial *or* is more prominent than a phonological phrase-initial *or*), then *or*'s prominence reflects the size of the phrase, and therefore the size of the boundary before *or*.

The third durational measure is the duration of that filled pause plus *or*, which I take to mainly reflect the size of the boundary before *or*. One effect measured by the duration of the filled pause reflects the prominence of *or*. The duration of *or* itself also reflects its prominence because the rime of an accented syllable is longer than the rime of an unaccented syllable (Dimitrova & Turk 2012). Assuming that the prominence of *or* is correlated with the size of the phrase that contains it, this measure therefore reflects the size of the boundary before *or*.

(21) Lillian will look for either Beatrice <filled pause> **(**or David.

2.5. Data analysis

I fitted three linear mixed effects models, with the three durational measures as the dependent variable in each model, and *either*'s position (pre-VP, pre-T' and pre-TP, reverse-helmert-coded) and condition (critical vs. control, dummy-coded) as fixed effects. I calculated p-values using using Satterthwaite's degrees of freedom method. The models included random intercepts and slopes by speaker and item group where those effects didn't result in a singular fit.

As a supplement, I also ran three linear mixed effects models of just the Critical Condition, with the three durational measures as the dependent variable in each model, and *either*'s position (pre-DP, pre-VP, pre-T' and pre-TP, reverse-helmert-coded) as fixed effects, and similar random effect structure to that of the main analyses.

2.6. Predictions

The movement-based account would predict that the prosodic boundaries do not differ, no matter where *either* is. Therefore, it would predict no significant difference among *either*'s positions within the Critical Condition.

In contrast, the ellipsis-based account would predict that within the Critical Condition, the average boundary of pre-VP and pre-T' *either* is smaller than the boundary of pre-TP *either*. The predictions of the ellipsis-based account about pre-VP and pre-T' *either* within the Critical Condition depend on the syntax-prosody mapping theory. A theory that considers the prosodic structure to be flatter than the syntactic structure by aligning all sub-clauses to φ (e.g., Selkirk 1986) would predict no significant difference between pre-VP and pre-T' *either*. This is also the prediction by a theory that maps maximal projections (but not non-maximal projections) to φs (e.g., Elfner 2015). A theory where the prosodic structure completely replicates the dominance relations in syntax (e.g., Wagner 2010) would predict that the boundary in a sentence with pre-VP *either* is smaller than that with pre-T' *either*.

All theories would analyze the Control Condition as clausal coordination, and thus would not expect a significant difference within the Control Condition. Because the movement-based theory also predicts no significant difference within the Critical Condition, this means that it predicts no interaction (i.e., no significant difference between the difference in the Critical Condition and the

difference in the Control Condition). In contrast, the ellipsis-based theory, which predicts a significant difference within the Critical Condition, would predict a significant interaction.

2.7. Results

Within the Critical Condition, the last rime in sentences with pre-TP *either* is 9.6 ms longer than the average of the last rime in sentences with pre-T' *either* and the last rime in sentences with pre-VP *either* ($p = 0.058$, close to the conventional significance threshold of 0.05). However, that difference does not differ from the difference within the Control Condition. The last rime in the Control Condition is 40.0 ms longer than that in the Critical Condition ($p < 0.001$).

The supplemental analysis showed that within the Critical Condition, the last rime in sentences with pre-TP *either* is 10.6 ms longer than the average of the last rime in sentences with pre-DP, pre-VP and pre-T' *either* ($p < 0.05$).

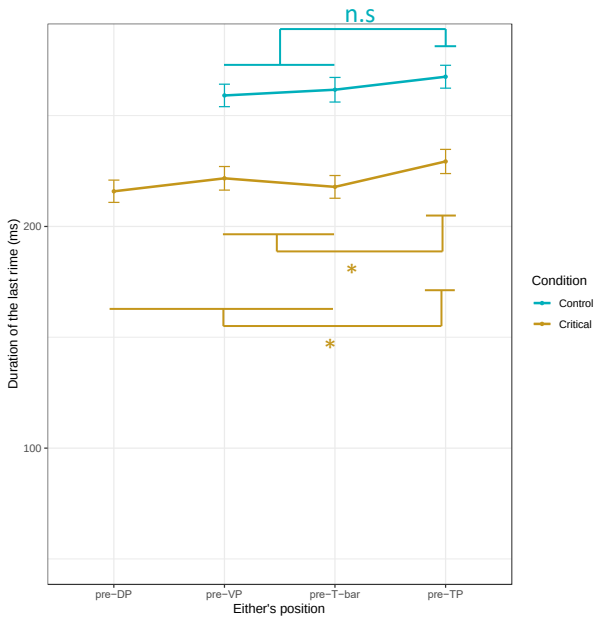


Figure 1: *Duration of the final rime before* or.

Within the Critical Condition, there is no significance in any comparison of the filled pause. There is a significant interaction between condition (Critical vs. Control) and *either*'s position (pre-VP vs. pre-T'): the difference in the filled pause's duration between pre-VP and pre-T' *either* in the Control Condition is 18.6 ms longer that in the Critical Condition ($p < 0.05$). The filled pause in the Control Condition is 24.8 ms longer than that in the Critical Condition ($p < 0.01$).

The supplemental analysis showed that within the Critical Condition, the filled pause in sentences with pre-TP *either* is 12.5 ms longer than the average of the filled pause in sentences with pre-DP, pre-VP and pre-T' *either* ($p < 0.01$).

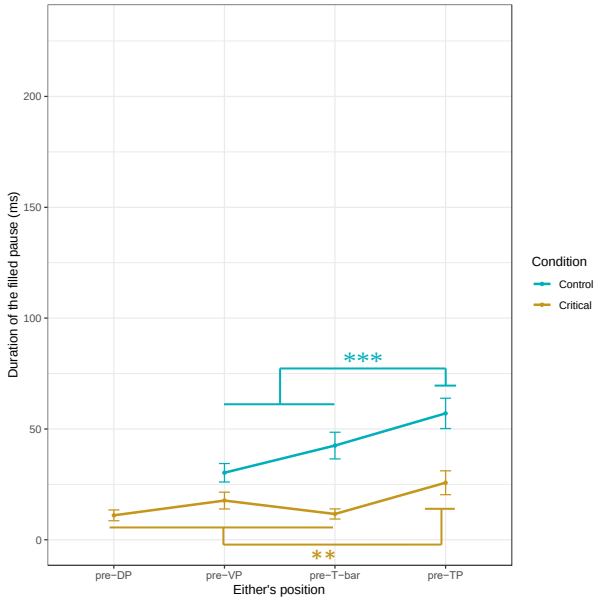


Figure 2: *Duration of the filled pause before* or.

Within the Critical Condition, the filled pause plus *or* in sentences with pre-TP *either* is 17.5 ms longer than the average of the last rime in sentences with pre-T' *either* and the last rime in sentences with pre-VP *either* ($p < 0.05$). However, that difference does not differ from the difference within the Control Condition. The last rime in the Control Condition is 52.4 ms longer than that in the Critical Condition ($p < 0.001$).

The supplemental analysis showed that within the Critical Condition, the filled pause plus *or* in sentences with pre-TP *either* is 18.7 ms longer than the average of the filled pause in sentences with pre-DP, pre-VP and pre-T' *either* ($p < 0.01$).

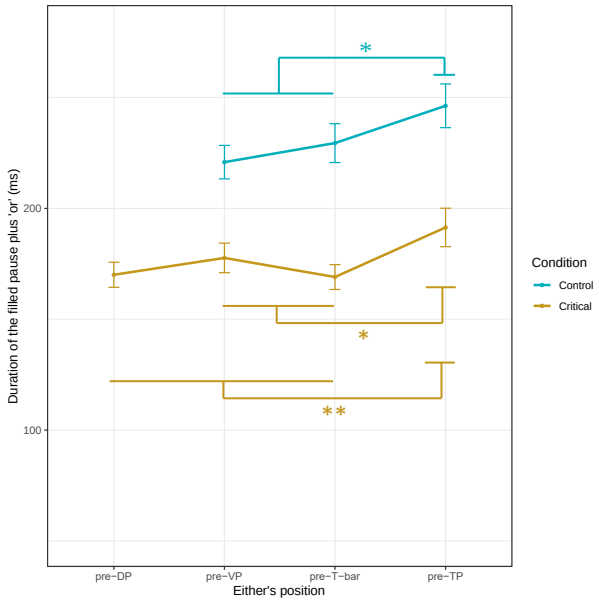


Figure 3: *Duration of the filled pause plus* or.

2.8. Discussion

Within the Critical Condition, there is a significant prosodic difference depending on *either*'s position, which seems to support the ellipsis-based account of *either…or…*, and challenge the movement-based account, which predicts no prosodic difference. But what is surprising is the significant prosodic difference within the Control Condition (only for the durations of the filled pause and of that pause plus *or*).[3] Furthermore, there is no interaction, suggesting that the prosodic differences I found within the Critical Condition do not differ from the differences within the Control Condition. The prosodic difference within the Control Condition suggests that *either*'s surface position affects the prosodic boundaries following *Beatrice* and preceding *or* in (18a-c). Those boundaries seem to be the largest when *either* is before a TP. Since the sentences in the Critical Condition also vary by *either*'s surface position, *either*'s surface position at least partly contributes to the prosodic differences within the Critical Condition.

Thus, the prosodic results of the Critical Condition do not tell us which syntactic analysis of *either…or…* is correct. If the movement-based analysis is correct, then the only factor responsible for the prosodic differences within the Critical Condition is *either*'s surface position, but it is hard to explain why *either*'s surface position could affect the boundaries following *Beatrice* and preceding *or*. If the ellipsis-based analysis is correct, then there are at least two factors that are responsible for the prosodic differences within the Critical Condition: *either*'s surface position and the underlying syntactic structure, as the ellipsis-based account proposed. But the effect of the latter source is not large enough to create a significant interaction between conditions.

Either way, we need to explain why there is a significant difference within the Control Condition, something that cannot be explained by any syntactic theory and theory of syntax-prosody mapping. Holding constant the syntactic structure within the Control Condition (i.e., clausal coordination), why does *either*'s surface position affect the boundaries following *Beatrice* and preceding *or*? Why are those boundaries the largest when *either* is pre-TP?

2.8.1. I speculate about possible reasons for the surprising results

I leave these questions to future research, but point out a possibly related fact: I have argued in chapter 2 that *either* is a focus-sensitive operator. Interestingly, other focus-sensitive operators are not tolerated in the pre-TP position. For example, pre-TP *both* is bad:

(22) a. Lillian will look for both Beatrice and David.
b. ?Lillian will both look for Beatrice and David.
c. *Both Lillian will look for Beatrice and David.

(23) a. Lillian will both look for Beatrice and she will look for David.
b. *Both Lillian will look for Beatrice and she will look for David.

Pre-TP *only* is also bad when it associates with object focus:

[3] Prior to the experiment presented in this appendix, I had conducted a pilot study on a smaller scale (1 set of items and 13 participants), which had different results: steady increase in boundary size from pre-DP *either* to pre-VP, pre-T' and pre-TP *either* in the Critical Condition and no difference in the Control Condition. Because those results looked promising, I conducted the full experiment. The results of the pilot study are reported in Wu (to appear).

(24) a. Lillian will look for only Beatrice$_F$.
b. Lillian will only look for Beatrice$_F$.
c. *Only Lillian will look for Beatrice$_F$.

Furthermore, not every native speaker I consulted in fact accepts pre-TP *either* (17d). Perhaps pre-TP *either* triggers large prosodic boundaries in the Control Condition because pre-TP *either* is "less grammatical" than *either* in other positions (though it may be better than pre-TP *both* and *only*), and speakers may tend to pause after *Beatrice* to reflect that degradation. Even if this is the case, we will still need to formulate theories of grammaticality and how it might affect processing and speech production, to explain why speakers pause after *Beatrice* in particular, but not in some other position to resolve the processing difficulty.

2.8.2. The surprising results have nothing to do with focus prominence

It is worth mentioning that the durational effects I found probably have nothing to do with the prominence of *Beatrice*. In all the target sentences, the last word before *or* (e.g., *Beatrice* in (17a-d) and (18a-c)) is contrastively focused. As I have argued in chapter 2, *either* is a focus-sensitive operator and associates with *Beatrice*. One might thus wonder if the prosodic effects I found in the Control Condition could be understood as the following: *either*'s surface position affects the prosodic prominence of the focus that it associates with (e.g., *either*'s surface distance to *Beatrice* affects the prominence of *Beatrice* in (17a-d) and (18a-c)). This can't be, because the duration of the filled pause and *or* are unlikely to be correlated with *Beatrice*'s prominence. I also measured the duration of the primarily-stressed segment of the last word before *or* (e.g., *ea* of Béatrice), which according to Dimitrova and Turk (2012) is correlated with the prosodic prominence of this word. I did not find any significant variation of this primarily-stressed segment within the Critical Condition or the Control Condition, suggesting that its prominence does not seem to be correlated with *either*'s surface position.

2.8.3. The surprising results suggest that ɪ can be recursive

The surprising results of the Control Condition have interesting implications for our understanding of the prosodic structure. Because (18a-c) all involve coordination of matrix clauses, my finding that the coordinated clause in (18c) corresponds to a larger prosodic phrase than the coordinated clauses in (18a-b) suggests that matrix clauses can correspond to prosodic phrases with different strengths. If we follow the assumption of some mapping theories that a syntactic clause corresponds to a special prosodic category ɪ, which is different from the prosodic category of syntactic subclauses φ, then the coordinated clauses in (18a-c) should all be mapped to ɪs. My finding thus suggests that these ɪs have different prosodic strengths, and therefore prosodic theories should be able to make finer distinctions between different ɪs. One possible way to do so is to allow recursive ɪs.

3. Conclusion

This appendix has presented a prosodic investigation of *either…or…* sentences that was intended to adjudicate between syntactic analyses of *either…or…*, and inform us about the prosodic structure of coordination. But it was inconclusive because of the surprising result that holding

constant underlying syntactic structure, *either*'s surface position affects the prosodic boundary following the first disjunct. This leads to interesting new questions about why focus sensitive operators are generally dispreferred before a TP, and how this might affect the speech production of these degraded sentences.

4. Experimental items

This section presents the entire sets of experimental items. There were ten sets, each set containing seven sentences (four in the Critical Condition and three in the Control Condition).

(25) a. Lillian will look for either Beatrice or David, but she doesn't care who she will find.
b. Lillian will either look for Beatrice or David, but she hasn't decided which thing she will do.
c. Lillian either will look for Beatrice or David, but she hasn't decided which thing she will do.
d. Either Lillian will look for Beatrice or David, but I don't know which will happen.
e. Lillian will either look for Beatrice or she will look for David, but I don't know which will happen.
f. Lillian either will look for Beatrice or she will look for David, but I don't know which will happen.
g. Either Lillian will look for Beatrice or she will look for David, but I don't know which will happen.

(26) a. Aaron will search for either Austin or Hudson, but he doesn't care who he will find.
b. Aaron will either search for Austin or Hudson, but he hasn't decided which thing he will do.
c. Aaron either will search for Austin or Hudson, but he hasn't decided which thing he will do.
d. Either Aaron will search for Austin or Hudson, but I don't know which will happen.
e. Aaron will either search for Austin or he will search for Hudson, but I don't know which will happen.
f. Aaron either will search for Austin or he will search for Hudson, but I don't know which will happen.
g. Either Aaron will search for Austin or he will search for Hudson, but I don't know which will happen.

(27) a. Noah will accept either a mention or an endorsement, but he doesn't care which one he will get.
b. Noah will either accept a mention or an endorsement, but he hasn't decided which thing he will do.
c. Noah either will accept a mention or an endorsement, but he hasn't decided which thing he will do.
d. Either Noah will accept a mention or an endorsement, but I don't know which will happen.
e. Noah will either accept a mention or he will accept an endorsement, but I don't know which will happen.

f. Noah either will accept a mention or he will accept an endorsement, but I don't know which will happen.
g. Either Noah will accept a mention or he will accept an endorsement, but I don't know which will happen.

(28) a. The lion will hunt for either the tortoise or the rabbit, but he doesn't care which animal he will catch.
b. The lion will either hunt for the tortoise or the rabbit, but he hasn't decided which thing he will do.
c. The lion either will hunt for the tortoise or the rabbit, but he hasn't decided which thing he will do.
d. Either the lion will hunt for the tortoise or the rabbit, but I don't know which will happen.
e. The lion will either hunt for the tortoise or he will hunt for the rabbit, but I don't know which will happen.
f. The lion either will hunt for the tortoise or he will hunt for the rabbit, but I don't know which will happen.
g. Either the lion will hunt for the tortoise or he will hunt for the rabbit, but I don't know which will happen.

(29) a. Peter will wait for either Candice or Alex, but he doesn't care who he will see.
b. Peter will either wait for Candice or Alex, but he hasn't decided which thing he will do.
c. Peter either will wait for Candice or Alex, but he hasn't decided which thing he will do.
d. Either Peter will wait for Candice or Alex, but I don't know which will happen.
e. Peter will either wait for Candice or he will wait for Alex, but I don't know which will happen.
f. Peter either will wait for Candice or he will wait for Alex, but I don't know which will happen.
g. Either Peter will wait for Candice or he will wait for Alex, but I don't know which will happen.

(30) a. Tayler will ask for either a bookcase or a mattress, but she doesn't care which one she will get.
b. Tayler will either ask for a bookcase or a mattress, but she hasn't decided which thing she will do.
c. Tayler either will ask for a bookcase or a mattress, but she hasn't decided which thing she will do.
d. Either Tayler will ask for a bookcase or a mattress, but I don't know which will happen.
e. Tayler will either ask for a bookcase or she will ask for a mattress, but I don't know which will happen.
f. Tayler either will ask for a bookcase or she will ask for a mattress, but I don't know which will happen.
g. Either Tayler will ask for a bookcase or she will ask for a mattress, but I don't know which will happen.

(31) a. The teacher will require either a practice or a comment, but she doesn't care which one she will get.
b. The teacher will either require a practice or a comment, but she hasn't decided which thing she will do.
c. The teacher either will require a practice or a comment, but she hasn't decided which thing she will do.
d. Either the teacher will require a practice or a comment, but I don't know which will happen.
e. The teacher will either require a practice or she will require a comment, but I don't know which will happen.
f. The teacher either will require a practice or she will require a comment, but I don't know which will happen.
g. Either the teacher will require a practice or she will require a comment, but I don't know which will happen.

(32) a. The president will insist on either a negotiation or a compensation, but she doesn't care which one she will get.
b. The president will either insist on a negotiation or a compensation, but she hasn't decided which thing she will do.
c. The president either will insist on a negotiation or a compensation, but she hasn't decided which thing she will do.
d. Either the president will insist on a negotiation or a compensation, but I don't know which will happen.
e. The president will either insist on a negotiation or she will insist on a compensation, but I don't know which will happen.
f. The president either will insist on a negotiation or she will insist on a compensation, but I don't know which will happen.
g. Either the president will insist on a negotiation or she will insist on a compensation, but I don't know which will happen.

(33) a. Tyler will demand either a promotion or an assistant, but he doesn't care which perk he will get.
b. Tyler will either demand a promotion or an assistant, but he hasn't decided which thing he will do.
c. Tyler either will demand a promotion or an assistant, but he hasn't decided which thing he will do.
d. Either Tyler will demand a promotion or an assistant, but I don't know which will happen.
e. Tyler will either demand a promotion or he will demand an assistant, but I don't know which will happen.
f. Tyler either will demand a promotion or he will demand an assistant, but I don't know which will happen.
g. Either Tyler will demand a promotion or he will demand an assistant, but I don't know which will happen.

(34) a. Patrick will allow for either sweatpants or slippers, but he doesn't care which item people will wear.

b. Patrick will either allow for sweatpants or slippers, but he hasn't decided which thing he will do.
c. Patrick either will allow for sweatpants or slippers, but he hasn't decided which thing he will do.
d. Either Patrick will allow for sweatpants or slippers, but I don't know which will happen.
e. Patrick will either allow for sweatpants or he will allow for slippers, but I don't know which will happen.
f. Patrick either will allow for sweatpants or he will allow for slippers, but I don't know which will happen.
g. Either Patrick will allow for sweatpants or he will allow for slippers, but I don't know which will happen.

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