

NORTHWESTERN UNIVERSITY

Morphological recoverability in Gapping

A DISSERTATION

SUBMITTED TO THE GRADUATE SCHOOL
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

for the degree

DOCTOR OF PHILOSOPHY

Field of Linguistics

By

Michael Frazier

EVANSTON, ILLINOIS

December 2015

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Acknowledgements

The people who deserve my thanks in regard to this dissertation are so numerous that what follows does not pretend to be an exhaustive list of them. To those I have inadvertently omitted (as well as to anyone whom I have included against their will), I offer my preemptive apologies.

Thanks first to the National Science Foundation for supporting some of the research presented here via DDRIG:1348677, and to Northwestern University for paying my stipend.

Thank you to all those who have contributed their acceptability judgments, especially Aya Meltzer-Asscher, Peter Baumann, Marcel Den Dikken, Matthias Ingelstam, and the very many English speakers against whom I have checked my (by now thoroughly borked) judgments of Gapping. *I hope to someday be able to assist you just as you me.

To my long-suffering committee. You are living saints. But most especially to Masaya Yoshida, who has tolerated the intolerable so often now.

To my parents, without whom this dissertation could not have happened for obvious reasons. And to my brother Matt, for being the successful one. And to my inspiring grandparents, here and departed. Despite appearances, I'm trying here.

To the excellent research assistants Corey Nelson, Casey Colby, and Elizabeth Dunn who assisted in running and analyzing these experiments.

To my fellow graduate students and colleagues who have provided advice and support during this ridiculous undertaking, especially Lauren Ackerman, Peter Baumann, Jordana Heller, Rachel Baker, Kat Hall, and most especially David Potter, my dear friend and valued collaborator. To my roommate and fellow grad student Tommy Denby, for enduring my mess. And to Michael Blasingame, for so many reasons.

To my excellent colleagues elsewhere who have provided feedback about some of what is contained here, and especially to Dave Kush, Brooke Larson, and Julian Barnes: you are absolved of all responsibility for this.

To the ones who have stood beside me during all this—RSM, JSJ, KDR, but most especially the appropriately-initialed GR‘A’D—you know who you are, and you know that I love you. My thanks cannot in principle be enough.

To my friends outside of academia, but especially William Sammarco. We cook together an appropriate amount.

And to Sunni. Jag är tydligen inte den mest meningslösa personen i världen. (Did I get that right?)

Dedication

For syntax.

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CHAPTER 1

Introduction

This thesis deals with the interface between the narrow syntax, the unbounded combinatorial system that licenses the abstract hierarchical forms of phrases, and the phonology, the similarly abstract system that licenses their surface forms. In generative syntactic theories, this interface has traditionally been referred to as *Phonetic Form* (PF). In particular, this thesis is concerned with the interaction of morphological exponence (chiefly agreement marking) with ellipsis, both in syntactic representation and in on-line processing.

The plan for this thesis is as follows. In the remainder of this chapter, I review some of the empirical phenomena and theoretical approaches that are relevant to the discussion of ellipsis' interaction with morphology, including a defense of an ellipsis theory of the Gapping construction. Chapter 2 expands the argument that Gapping should be regarded as a form of ellipsis, taking up an ambiguity argument I previously presented in Potter et al. (under revisions). That chapter also introduces some discussion of Gapping's interactions with morphological exponence. Chapter 3 discusses some English-internal and cross-linguistic evidence that, under rare circumstances, agreement-related ϕ -features can be relevant for the calculation of antecedent-ellipsis identity in Gapping, and offers some suggestions about the implications of this observation for the architecture of the grammar. The next two chapters report experimental work. In them, I investigate whether and how agreement information is used on-line in retrieving a Gapping antecedent, and in identifying an ambiguous Gapping site, respectively, before concluding in Chapter 6.

1.1. Ellipsis as PF-deletion

The approach to ellipsis that I adopt in this work belongs to the class of PF-deletion theories (e.g. Ross 1969b, Sag 1976, Hankamer 1979, Lasnik 1999; 2001b, Merchant 2001; 2002, *inter alia*), under which elided material is present in the syntax and deleted at or shortly before the interface level PF. The term PF is used in a number of ways in the generative literature. In what follows it will be important to distinguish two of these usages. To refer to the point in the derivation where a linguistic object enters the purview of

the phonology I use the term ‘PF-interface’. To refer to all of the steps of the derivation that occur after a phrase marker leaves the purview of the narrow syntax but before it enters the purview of the phonology (i.e. before the PF-interface in the sense just specified) I use the term ‘PF-branch’, a reference to the common ‘inverted-Y’ heuristic for the architecture of the grammar as a whole.

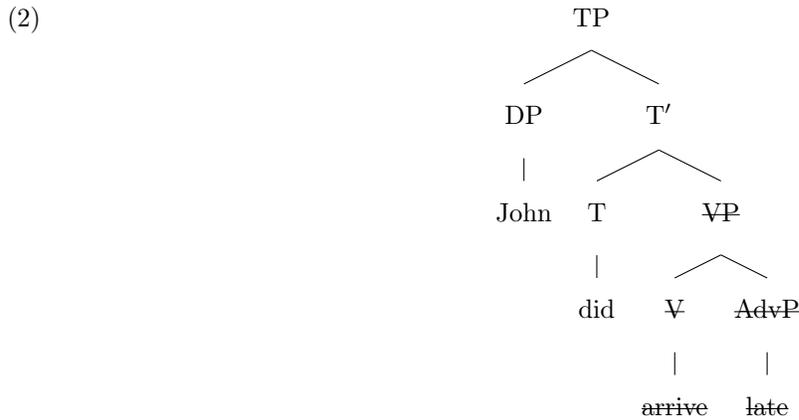
At this point we can say what range of hypotheses can be meant by a PF-deletion theory of ellipsis. A PF-deletion hypothesis for ellipsis is minimally one where the elided material is present in the narrow syntax and not at the PF-interface. Usually approaches of this kind posit deletion somewhere in the PF-branch, though see Baltin (2012) for an exception. I will sometimes refer to constructions derived in this way as “deletion”, to distinguish them from constructions in which material present in the interpretation is absent from the surface form for some reason other than deletion of syntactic material at or before the interface with PF. These latter constructions, together with deletion, comprise ellipsis in the broad sense.

The principal alternative to PF-deletion theories of ellipsis is the class of analyses known as LF-copying (e.g. Williams 1977, Lobeck 1995, Chung et al. 1995, Fiengo & May 1994). Since the elided material must be present at LF, being in the interpretation, and absent at PF, being unpronounced, it must either have been introduced at (or on the way to) LF or deleted at (or on the way to) PF. On an LF-copying analysis, the structure of an ellipsis site in the syntax is simply an empty category $[\epsilon]$ inserted in the syntax. So an expression like *John did* (as in answer to a question like *Did Mary arrive late?*) would have a structure as in (1). At the LF interface, the content of $[\epsilon]$ ’s antecedent is copied into its position, allowing the ellipsis to be interpreted and deriving the antecedent-ellipsis identity condition.



On PF-deletion analyses of ellipsis, the structure of the *John did* example will be approximately (2)—that is, exactly the same as that of an unelided equivalent, with the exception that the ellipsis site is marked by

some mechanism before the PF interface with an instruction for the phonology not to pronounce its contents, represented here by ~~strike through~~.

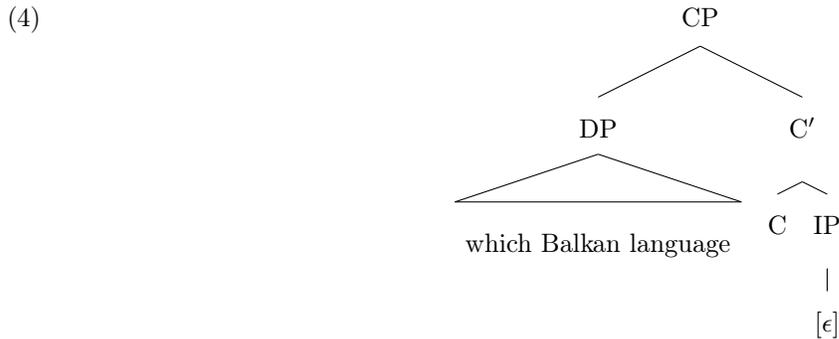


There are two principal classes of evidence in favor of LF-copying analyses of ellipsis.¹ The first is that certain kinds of ellipsis, in particular Sluicing, can leave behind a remnant from inside an island domain, where the corresponding unelided sentence is ungrammatical (3, Merchant 2001).

- (3) a. They want to hire someone who speaks a Balkan language, but I don't remember which Balkan language.
- b. *They want to hire someone who speaks a Balkan language, but I don't remember which Balkan language they want to hire someone who speaks.

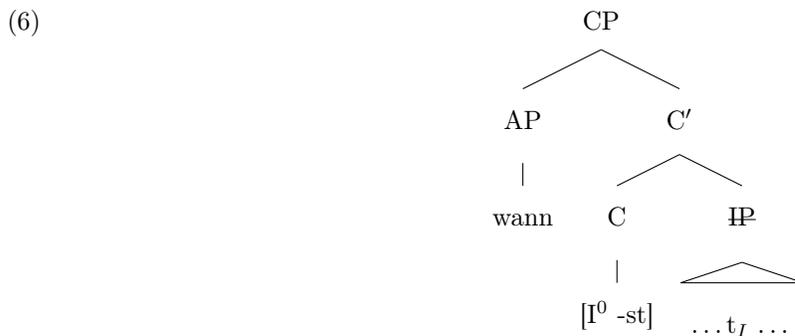
If island violations are syntactic violations, and if the syntax of a sluiced sentence is the same as that of its unelided counterpart, the contrast in (3) is unexpected. On the other hand, if the derivation of (3a) does not involve any *wh*-movement, the lack of an island effect follows straightforwardly. The sluiced clause has a structure like (4), with the *wh*-phrase base-generated in the specifier of a CP whose IP complement is null. The *wh*-phrase comes to have its interpretation only at LF, when the content of its antecedent is copied into the position of ϵ . Provided that at LF variable binding is not subject to subjacency, *which Balkan language* can bind the variable introduced by the indefinite DP in its antecedent Chung et al. (1995).

¹The discussion here largely follows Merchant (2001).



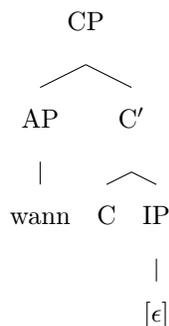
The second class of argument in favor of LF-copying approaches comes from the inability of certain kinds of material to move out of the ellipsis site. For instance, in Bavarian, the agreeing complementizer (assumed to arise by movement of an agreement morpheme from I to C) is obligatorily absent in Sluicing.

- (5) a. Du woidd-st doch kumma, owa mia wissn ned wann-st du kumma woidd-st.
 you wanted-2SG PRT come but we know not when-2SG you come wanted-2SG
 You wanted to come, but we don't know when you wanted to come.
- b. Du woidd-st doch kumma, owa mia wissn ned wann(*-st).
 you wanted-2SG PRT come but we know not when-2SG
 You wanted to come, but we don't know when. (from Lobeck 1995)



If the syntax of the Sluiced and un-Sluiced variants is the same, this is surprising; in particular, if Sluicing involves IP-deletion, rather than a null IP, it is not clear how I-to-C movement of the agreement morpheme (6) is ruled out in Sluicing. On the other hand, if the structure is as in (7), the unavailability of *-st* in Sluicing is unsurprising, since there is no head I present in the syntax to move to C.

(7)



This is not a particularly convincing argument for LF-copying, however. (Lasnik, 1999) observes that Sluicing also occurs in matrix contexts (8), in which T-to-C movement is obligatory in English (9), but here as well C is obligatorily omitted (10).

(8) Speaker A: Mary will see someone.

Speaker B: Who ~~Mary will see~~?

(9) a. Who will Mary see?

b. *Who Mary will see?

(10) Speaker A: Mary will see someone.

Speaker B: *Who will ~~Mary see~~?

Lasnik's account of this phenomenon relies upon the idea that the feature driving T-to-C movement of the auxiliary in examples like (9) resides on the auxiliary in T itself, rather than on the destination of movement, C. If this feature causes a crash if it remains unchecked at PF, the derivation can converge either if such checking occurs or if the offending feature on the auxiliary is removed by ellipsis. On an account like this, if movement (for whatever reason) fails to apply, ellipsis is the only option.²

A somewhat different account of the absence of complementizers in sluicing comes from (Thoms, 2010), who proposes that ellipsis is licensed by overt movement. When an element moves and its base position fails to be marked for deletion, the sister category of its movement destination is marked for deletion instead to avoid the problem of multiple linearization. On an account like this, the absence of complementizers in

²This account therefore suggests that failure of movement is what causes ellipsis to apply in such a case, since if ellipsis applies freely (other than being obligatory when movement fails to apply) it is not clear what rules out (10).

sluicing follows because it is the sluicing remnant that triggers deletion of its sister, the C' , which of course contains the complementizer.³

Support for PF-deletion approaches to ellipsis in general comes from the sensitivity of elliptical phenomena to syntactic constraints. These arguments all take essentially the same form: the remnants of an elliptical construction are subject to some condition not plausibly imposed at LF. If an ellipsis can be shown to be subject to a syntactic constraint not ascribable to LF, then the elided material must be present in the syntax proper, favoring a PF-deletion account.

For instance, Stjepanovic (1999) and Merchant (2001) discuss a Superiority effect in multiple sluicing in (among other languages) Serbo-Croatian, such that the order of multiple *wh*-remnants must match their base-generated order.

- (11) a. Neko je udario nekog.
 someone is hit someone
 Someone hit someone.
- b. Ko koga? / *Koga ko?
 who whom / whom who
 Who hit whom?

If Superiority violations are the result of an illicit order of movement operations in the syntax, the sluiced clause must have been syntactically present at some point in the derivation.⁴

Similarly, Merchant (2001) documents Case-matching effects in Sluicing in a variety of languages. The generalization is that the *wh*-word remnant of the sluice must bear the case it would bear in the sentence's unelided equivalent. Provided Case (unlike e.g. θ -roles) is not interpreted at LF, this suggests that the Case-licensing verb is present in the syntax.⁵

³Thoms' proposal is very attractive, at least for ellipses for which a movement account of sister of the elided constituent is best motivated. However, it appears to make the prediction that *whether* should license ellipsis of C' , at least on the assumption that *whether* comes to occupy its clause-initial position via *wh*-movement, and that this movement is phrasal movement into the same position other *wh*-phrases land in (Larson, 1985). This prediction is false:

- i. *Maybe Mary left, but I don't know whether.

⁴Note that if instead Superiority reduces to the ECP (Chomsky, 1981) and the ECP is a constraint on LF representations (Kayne, 1979), this argument does not go through. See (Hendrick & Rochemont, 1988; Hornstein, 1995), however, for arguments that Superiority cannot be reduced to the ECP (at least not entirely).

⁵Similar facts obtain for P-stranding in Sluicing, which is generally possible in languages with P-stranding generally, and not elsewhere. Though the empirical picture is somewhat more complex than Merchant originally found, see Rodrigues et al. (2009) for arguments that the P-stranding generalization is still valid.

- (12) Er will jemandem schmeicheln, aber sie wissen nicht, wem/*wer/*wen.
 he wants someone.DAT flatter but they know not who.DAT/NOM/ACC
 He wants to flatter someone, but they don't know who. (from Ross 1969a)

Merchant points out that the inability of additional material to leave the elided domain cannot serve as evidence for LF-copying. This is because, on these analyses, the *wh*-remnant itself, which normally would come to occupy the CP,Spec position by movement, must be assumed to have been exceptionally base-generated in the C domain. Once exceptional base-generation of remnant material is admitted, as it must be to account for Sluicing at all, there seems to be no principled reason to exclude it for some C domain elements and not for others. Merchant goes on to show how the island-amelioration effects observed in Sluicing can be accounted for on a deletion approach by attributing (a relevant subset of) island effects to well-formedness conditions on traces at PF.⁶

Another piece of evidence for the existence of syntactic structure in ellipsis sites is presented in Yoshida et al. (2014). There we point out the previously unobserved fact that Parasitic Gaps are licit in Sluicing remnants, as in (13).

- (13) My editor told me [which book]_{*i*} I must review *t_i*, but I don't remember how soon after receiving *t_i*.

Parasitic gaps are known to require a licensing gap derived by overt A' movement (e.g. Engdahl 1983). *Wh*-in-situ elements cannot in general license them (14).

- (14) a. My editor told me [which book]_{*i*} I must review *t_i* soon after receiving *t_i*.
 b. *My editor told me who must review [which book]_{*i*} soon after receiving *t_i*.

The availability of Parasitic gaps in Sluicing remnants is strong evidence that the ellipsis site in Sluicing contains covert syntactic structure. Importantly, the Parasitic gap in the sluicing remnant in (13) cannot be being licensed by the antecedent clause: when the antecedent clause is unchanged but the potentially Sluiced clause is instead overt, and contains a structure that cannot license a Parasitic gap, the example is degraded (15). If the Parasitic gap in the Sluicing remnant were licensed by the antecedent clause, we would predict (15) to be good.

⁶For detailed discussion, see Merchant 2001, 2004, 2008b, etc.

- (15) *My editor told me [which book]_i I must review t_i, but I don't remember how soon after receiving t_i I must review it.

Although these data are not entirely incompatible with LF-copying analyses, they are on the standard assumption that what distinguishes overt and covert movement is simply whether the movement takes place before or after spellout. If this is the case, then on an LF-copying analysis there will be no A' movement present at spellout to license the PG, and (13) should be illicit, contrary to fact. To accommodate this, an LF-copying analysis would have to assume (i) that overt and covert movement gaps are featurally distinct in some way (by assigning a [+PG-licensor] feature to overt movement gaps, for instance) and (ii) that the relation between a Parasitic gap and its licensing gap is checked at LF. If (i) is not true, and instead (as is standardly assumed) overt and covert movement differ only in their timing relative to spellout, there will be no way to rule in examples like (13) while ruling out examples like (14b). Similarly, if the Parasitic gap-licensing gap relation is checked at PF, rather than LF (ii), the Parasitic gap will still not be licensed at the relevant level of representation, since the licensing gap will only be copied into the [e] in the Sluicing site at LF. The fact that covert movement does not in general license Parasitic gaps (14) strongly suggests that (ii) is false.

1.2. Gapping

The construction known as Gapping (e.g. 16) is clearly an ellipsis phenomenon in the broad sense (something in the interpretation is absent in the overt form) but it is controversial whether it is derived via deletion of syntactically present material at or before the PF-interface. In this section, I outline the distinctive properties of Gapping and summarize a non-ellipsis account of the construction. Below I will argue that there is good reason not to discount an ellipsis treatment of Gapping.

- (16) John drinks coffee, and Mary, tea.

Gapping displays the following curious properties (summarized in Johnson (2009)), for which any theoretical treatment of the construction must account.

- (17) **Restriction to coordinate structures**

**John drinks coffee, although/because/while Mary, tea.

(18) **Antecedent subject can scope over Gapped clause**

No woman_i drank coffee and her_i husband, tea.

(19) **No embedding of Gapped clause**

**John drinks coffee, and I suspect (that) Mary, tea.

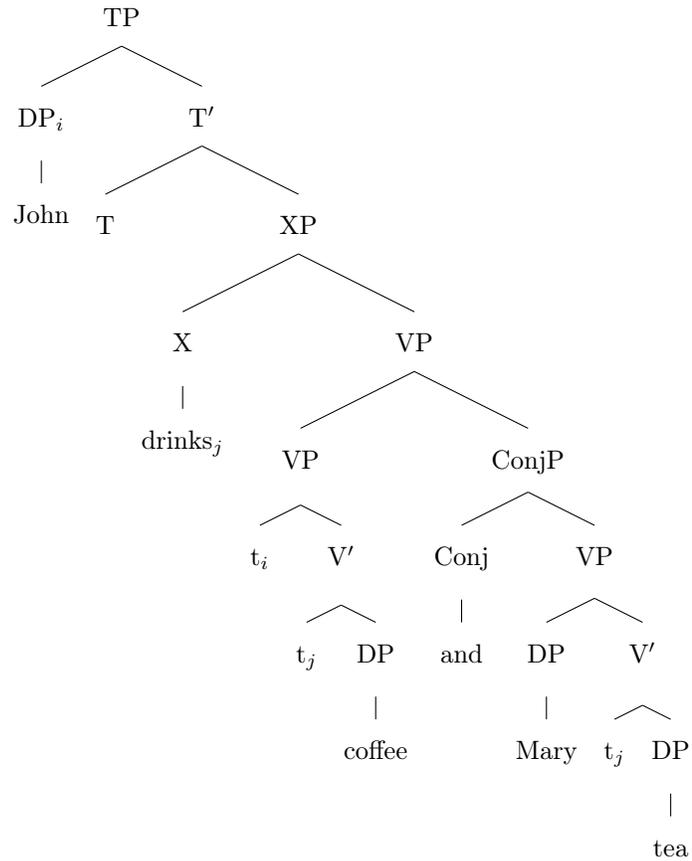
(20) **No embedding of antecedent clause**

**[I suspect that John drinks coffee], and [Mary, tea].

Across-the-Board (ATB)-movement analyses of Gapping, such as Johnson's, have the virtue that they account automatically for a number of peculiar properties of the construction which do not obviously follow if the absence of verbal material in the second conjunct of a Gapping construction is due to ellipsis in the narrow sense.

In the structure in (21), which roughly schematizes this class of proposals, the 'Gap' in the Gapped clause has arisen due to coordination of VP level constituents under a single T. The Vs of both clauses have moved ATB to a shared functional projection somewhere below T. The left conjunct subject (*John*) has moved into the shared Spec,TP, while the right conjunct subject has remained in situ.

(21)



This proposal accounts naturally for the distinctive properties of Gapping. Because only the left conjunct's subject has raised over the coordination, it is able to take scope over both conjuncts. Similarly, because ATB movement is not supported outside of coordination contexts, the no-subordination restriction follows naturally. Lastly, the head movement constraint rules out embedding of either conjunct by prohibiting head movement across clause boundaries.⁷ A Johnson-style ATB-movement account's principal virtue, then, is that it can assimilate the distinctive properties of Gapping to an unusual configuration plus independently well-motivated well-formedness restrictions.

⁷Other versions of this approach, which use remnant phrasal movement rather than head movement to evacuate the conjuncts, have more difficulty explaining the no-embedding constraints.

1.2.1. Gapping as ellipsis

In spite of the successes of ATB analyses of Gapping, they encounter some conceptual and empirical problems. In this section, I argue that although Gapping has some properties that are unusual for an ellipsis construction, there is good reason to think that Gapping is in fact derived by ellipsis in the narrow sense.

Potter et al. (under revisions) argue that Gapping arises by deletion (i.e. it is ellipsis in the narrow sense) and that the apparent diversity in Gapping's behavior under conjunct-size tests results from Gapping derivations being available for coordinations of two different sizes. The properties that Gapping constructions have in common arise from general constraints on the behavior of ellipses that leave behind two focused remnants.

In particular, we argue that a systematic scope ambiguity present in Gapping, such that scope taking material high in the left conjunct can scope either over both conjuncts (*wide scope*) or individually within each conjunct (*distributive scope*), indicates that Gapping conjuncts can be of two different sizes (22). When they are large, the scope taking material will fall within the ellipsis and be deleted, yielding distributive scope, while when they are small, the scope taking material will not be present in the right conjunct and will simply take both conjuncts in its scope.

(22) James shouldn't order caviar and Mary chili.

(23) Wide scope: James shouldn't order caviar and Mary ~~order~~ chili.

a. $\neg\Diamond(\text{Order}(J, \text{caviar}) \wedge \text{Order}(M, \text{chili}))$

b. "There is an obligation for it not to be the case that James order caviar and Mary order chili"

(24) Distributive scope: James shouldn't order caviar and Mary ~~shouldn't order~~ chili.

a. $\neg\Diamond\text{Order}(J, \text{caviar}) \wedge \neg\Diamond\text{Order}(M, \text{chili})$

b. "There is an obligation for it not to be the case that James order caviar and there is an obligation for it not to be the case that Mary order chili"

We then show that one or the other readings disappears when Gapping is combined with constructions that should be available in only one conjunct size or the other. For instance, topicalization in the Gapped

clause is only possible with distributive scope because only here is the right conjunct large enough to contain a Topic phrase in the C domain (25), while ATB wh-movement out of both conjuncts is only compatible with wide scope, because only then are the conjuncts small enough to share a landing site for wh-movement (26). (This is structurally similar to the argument in Larson 2012 about Right-Node-Raising (RNR), though with a somewhat different conclusion.)

(25) Caviar, James can't eat and chili, Mary.

- a. * $\neg\circ(\text{Order}(\text{J}, \text{caviar}) \wedge \text{Order}(\text{M}, \text{chili}))$
- b. $\neg\circ\text{Order}(\text{J}, \text{caviar}) \wedge \neg\circ\text{Order}(\text{M}, \text{chili})$

(26) Who must James make a drawing of and Peter a painting of?

- a. Who must James [_{vP} make a drawing of] and [_{vP} Peter ~~make~~ a painting of]
- b. * Who₁ [_{CP} t₁ must he make a drawing of t₁] and [_{CP} t₁ Peter ~~must make~~ a painting of t₁]

Because deletion is independently necessary to derive large-conjunct Gapping, and because both readings are subject to the Gapping-particular no-subordination and no-embedding constraints, we argue that these constraints derive not from the size of the constituents coordinated, but from independent properties of ellipsis that leaves behind two evacuated remnants (for elaboration of these proposals, see Potter et al. under revisions), and consequently unify large- and small-conjunct gapping under a deletion analysis.

1.3. Matching requirements

The term *matching requirement* (Grimshaw 1977) refers to a configuration in which a single overt element is required to satisfy selectional or other featural requirements imposed in multiple positions, either because it has moved through these positions in the course of the derivation or because it falls under an identity condition on ellipsis in virtue of being the antecedent of a portion of deleted structure. *Matching requirements* are thus, descriptively, restrictions against distinctness between surface-absent linguistic elements (i.e. linguistic elements that are elided in at least the broad sense) and their antecedents. For instance, in the Polish examples in (27), from Franks (1995), an Across-the-Board moved wh-element must be compatible in case form with the case that the verbs governing both of its base positions assign. Because *lubi* and *nienawidzi* assign different cases (accusative and genitive), the wh-word cannot bind the traces in both positions simultaneously.

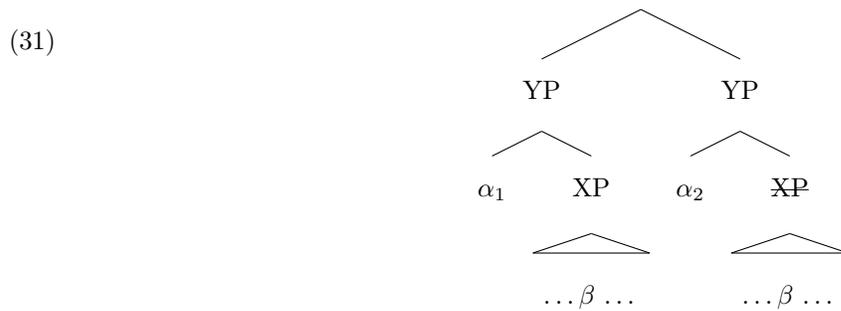
- (27) a. dziewczyna, *która_i/**której_i* Janek lubi *t_i* a Jerzy nienawidzi *t_i*
 girl who.ACC/who.GEN Janek likes and Jerzy hates
 the girl who Janek likes and Jerzy hates
- b. dziewczyna, która_i Janek lubi *t_i* a Jerzy kocha *t_i*
 girl who.ACC Janek likes and Jerzy loves
 the girl who Janek likes and Jerzy loves — *Polish*

Matching requirements can be enforced by the grammar in a number of ways; the most transparent approaches to the problem derive them from realization constraints on single lexical items present in multiple syntactic positions, i.e. as restrictions on the realization of moved elements. The example in (27) is a *wh*-question and thus clearly derived by movement; as I show below, however, matching requirements are not restricted to movement-derived configurations, including those that are most plausibly derived by ellipsis in the narrow sense.

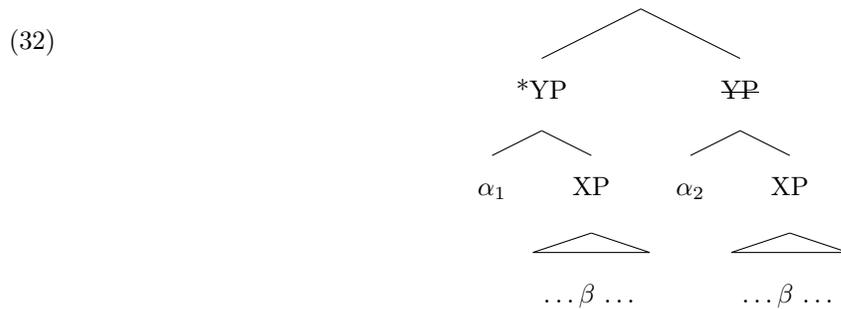
1.3.0.1. Resolution by syncretism. In some contexts, identity of form between the realizations of distinct featural requirement can remedy matching effect violations, a phenomenon known as *resolution by syncretism* (term due to Asarina 2010). In (28) below, the element ‘shared’ between clauses in a Right Node Raising (RNR) construction (*tarełka* ‘plate’) has distinct forms for accusative and nominative, the cases required in the two conjuncts between which it is shared. In (29), in contrast, the shared element *bljudce* ‘saucer’ is in a single form expressing either nominative or accusative, and the RNR is licit.

- (28) *On ne ostavil, tak kak emu nadoela, tarelk-u/a s chernoj kaemkoj.
 he not kept, as him sick.of, plate-ACC/NOM with black border
 He didn’t keep, as he was sick of, the plate with a black border.
- (29) On ne ostavil, tak kak emu nadoelo, bljudc-e s krasnoj kaemkoj.
 he not kept, as him sick.of, saucer-ACC&NOM with red border
 He didn’t keep, as he was sick of, the saucer with a red border.

A number of authors (e.g. Zaenen & Karttunen (1984), Pullum & Zwicky (1986), Asarina (2010)), suggest that resolution by syncretism is constrained by paradigm structure. In particular, resolution by syncretism is hypothesized to be impossible when distinct lexical items (or vocabulary insertion rules, depending on the formalism) realize the mismatched feature specifications. In contrast, when a single lexical form is simply underspecified the features in question, resolution by syncretism is purportedly possible. For instance, certain German nouns have identical accusative singular and dative plural forms. Nonetheless, examples like 30,



On the other hand if YP containing both α and β is deleted, mismatch between the α s is no longer tolerated, because the featural information introduced by α_2 differs from that of α_1 , but the two α s, being in an antecedent-ellipsis relationship, are subject to the identity condition on ellipsis.

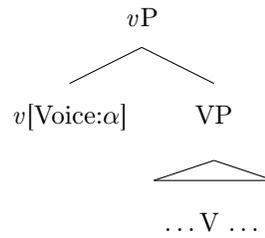


This is roughly the account Merchant (2007,2013) gives for the contrast in voice-mismatch between pseudo-Gapping and verb-phrase ellipsis (VPE). Merchant notes that while VPE permits voice mismatch, pseudo-Gapping does not (33).

- (33) a. This problem was to have been looked into, but obviously nobody did.
- b. * This problem was to have been looked into, but obviously nobody did that problem.

Adopting the proposal that the structure of the English verb phrase is like that schematized in (34), with a Voice introducing head taking the lexical VP as its complement, Merchant proposes that the VPE/pseudo-Gapping distinction is simply that the former involves deletion of VP, while the latter, of vP , such that the voice feature on the v head is subject to the identity constraint on ellipsis in the latter case but not the former.

(34)



The logic of this argument will be deployed repeatedly in what follows. That is, if two superficially similar elliptical configurations differ in their ability to tolerate mismatch of some feature F, this can be taken as evidence that the head bearing F is present inside the ellipsis and thus subject to the antecedent-ellipsis identity requirement, and mismatch ruled out for this reason.

We will see below, however, that this is not the only circumstance under which mismatch of a particular feature can be ruled out in ellipsis: it can also be ruled out in some cases when the elided category and its antecedent are coordinated under the functional head bearing F.

CHAPTER 2

Two structures for Gapping

This section summarizes arguments from Potter et al. (under revisions) to the effect that Gapping is structurally ambiguous between a structure involving clausal coordination and one involving conjunction of smaller, approximately *vP*-sized conjuncts, as well as presenting some new evidence to the same point from considerations of Tense matching, vehicle change, and comparison with several Gapping-like constructions.

2.1. Prior arguments

The launching point of Potter et al. (under revisions)'s argument for the structural ambiguity of Gapping is the observation that scope-taking elements are ambiguous in Gapping. A wide variety of such elements admit one reading, which we call the *wide-scope* reading, in which the scopal material takes scope over both conjuncts together, as well as a *distributive scope* reading, in which the scopal material takes scope independently in each conjunct. The two readings are exemplified in (35) for sentential negation. Impressionistically, the distributive scope reading is characterized by a distinct intonation break between the Gapped and antecedent conjunct and distinct, independent prosodic contours on each conjunct, while the wide scope reading is characterized by the absence of this intonation break and a single intonation contour covering both conjuncts.

- (35) a. James didn't order mussels and Mary shrimp.
 b. Wide scope $\neg(p \wedge q)$
 c. Distributive scope $\neg p \wedge \neg q$

It will be observed that one of the readings of an example like (35) entails the other; in particular, when negation is combined with coordinated clauses, the distributive scope reading entails the wide scope reading. It is correspondingly possible to create a context that renders the wide scope reading true and the distributive scope false, such as the one given in (36c; from Potter et al. under revisions).

(36) a. James didn't order mussels and Mary shrimp.

b. $\neg p \wedge \neg q \Rightarrow \neg(p \wedge q)$

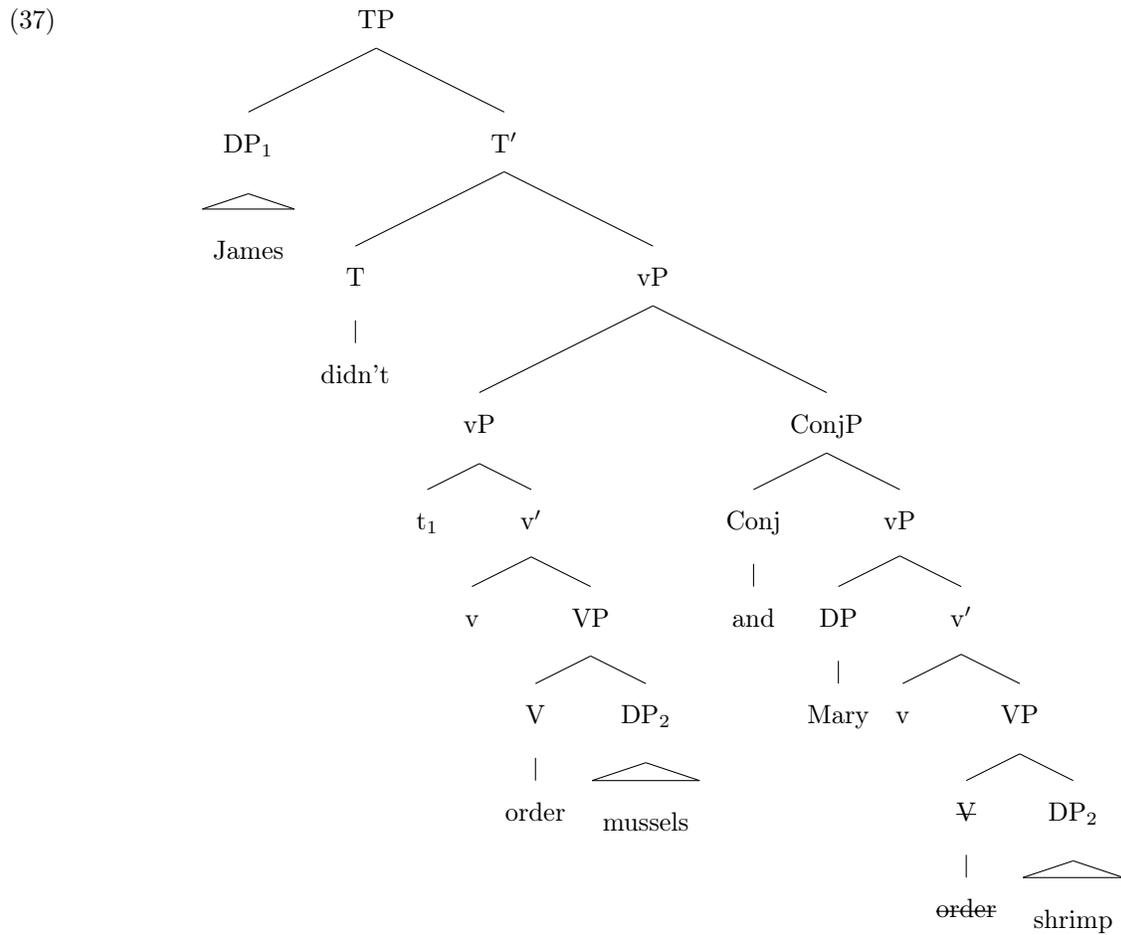
If it is the case that both p is false and q is false, then it is the case that p and q is false.

c. Context: James and Mary are having dinner together. James was planning to order mussels and Mary was planning to order shrimp. Although James did order mussels, Mary changed her mind and didn't order shrimp.

d. Wide scope $\neg(p \wedge q)$: True

e. Distributive scope $\neg p \wedge \neg q$: False

There is at least one objection that should be considered at the outset of this argument. Given that the distributive-scope reading of an example like (35) entails the wide-scope reading, it is conceivable that the apparent ambiguity is not the result of any syntactic difference between the two interpretations but is merely the result of some pragmatic enrichment phenomenon. This would mean positing that for an example like (35), the distributive scope reading would be effectively illusory, since in all contexts in which it is true, the wide scope reading is true as well; the wide scope reading would then be taken to be the only *semantic* interpretation of (35) and, under fairly standard assumptions about the relation between syntax and semantics (e.g. Partee 1975), the one reflected by its syntax. A possible structure corresponding to (35) could be as in (37), where a single instance of the sentential negation *didn't* C-commands both conjuncts.



To counter the possibility of an objection of this kind, is it necessary merely to observe that the entailment pattern reverses when negation is combined with disjoined clauses, which is no difficulty because Gapping is felicitous in disjunction. While in an example such as (36) above, the distributive scope reading entails the wide, in disjoined Gapping as in (38) it is the wide scope reading that entails the distributive. In a context like (38c), the distributive scope reading is true and the wide scope false.

(38) a. James didn't order mussels or Mary shrimp.

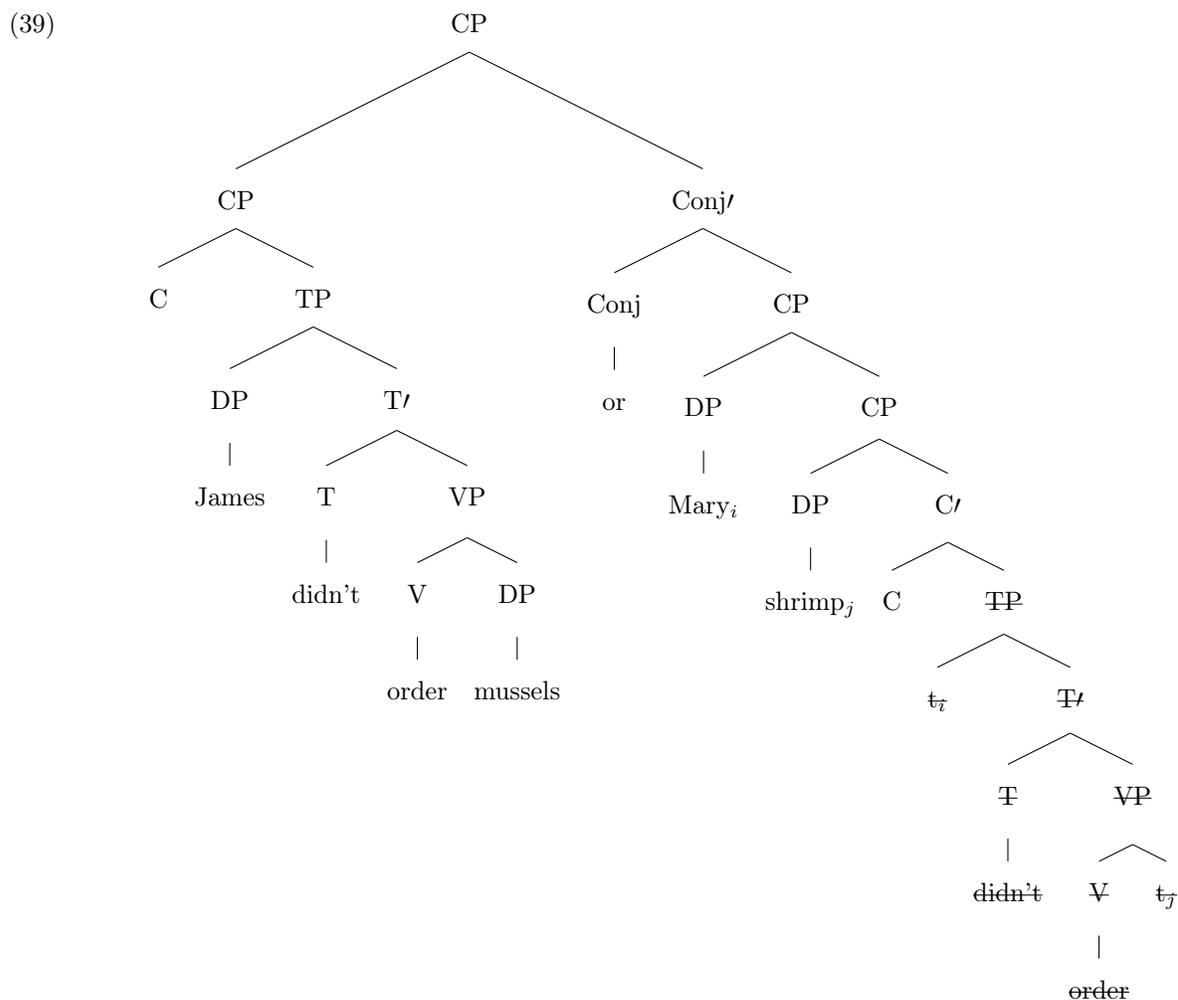
b. $\neg(p \vee q) \Rightarrow \neg p \vee \neg q$

If it is not the case that p or q is true, then p is false or q is false.

- c. Context: James and Marry are having dinner together. James was planning to order mussels and Mary was planning to order shrimp. Although James did order mussels, Mary changed her mind and didn't order shrimp.
- d. Wide scope $\neg(p \vee q)$: False
- e. Distributive scope $\neg p \vee \neg q$: True

Thus it appears that in Gapping between disjoined clauses, negation can scope under the connective, a behavior for which we did not find evidence in conjoined clauses. Because the wide scope reading entails the distributive for examples like (38), following our objection from above, we could propose that only a single structure is available to disjunctive Gapping. This would need to be different from the one (37) proposed for (35), however. In order for the negation to scope independently over each conjunct, the conjuncts themselves would have to be large enough to contain independent instances of T. The deleted portion must also be larger, in order to eliminate the right conjunct's *didn't* from the surface form. A candidate structure meeting these requirements is (39).¹

¹The precise positions of *Mary* and *shrimp* are irrelevant at this point in the discussion, so long as they are outside of TP.



Claiming that the only semantic reading of conjunctive and disjunctive Gapping examples is the stronger reading amounts to the claim that the negation must scope over the coordinator *and* and under *or* in just this restricted context. But in the absence of any evidence elsewhere in the language that the conjunct sizes of *and* and *or* should be restricted in this way, this approach is basically completely stipulative: *or* must conjoin clauses, and *and* VPs, just when Gapping applies to the conjuncts. It is more parsimonious to conclude that both scope readings are available generally, with one entailing the other.

Potter et al. observe that this ambiguity is quite general, obtaining for modals, negation, and several classes of adverbs. Importantly, it does not obtain for very low elements like low manner adverbs (Jackendoff, 1971) and adverbial negation (Klima, 1964), which are located inside the *vP* (Potsdam, 1998; Ernst, 2002; Jackendoff, 1969). These elements systematically lack a wide scope reading (40, 41). That this is so is

consistent with the hypothesis that the difference between wide and distributive scope readings in Gapping is due to the position of the scopal element above or below the coordination, and that coordination of smaller than approximately *vP*-sized conjuncts does not support Gapping.

(40) James can't quickly drink beer and Mary champagne.

$\# \neg \diamond \text{Quickly}(\text{Drink}(\text{J}, \text{beer}) \wedge \text{Drink}(\text{M}, \text{champagne}))$

(41) James shouldn't not cook dinner and Mary dessert.

$\# \neg \diamond \neg (\text{Cook}(\text{J}, \text{dinner}) \wedge \text{Cook}(\text{M}, \text{dessert}))$

If the wide and distributive scope readings are the result of a genuine structural ambiguity, there should be syntactic evidence that can distinguish them. In the following subsections I present some evidence of this kind, largely following the arguments in Potter et al.

2.1.0.2. Topicalized remnants. If the wide scope reading of Gapping results from coordination of approximately *vP*-sized conjuncts, then manipulating the example such that a *vP* structure for the right conjunct is impossible should yield an example with only the distributive scope reading. Topicalization of a remnant in each conjunct is one such environment. Because English does not allow topicalization to the edge of the VP under normal circumstances, topicalizing an argument in the Gapped conjunct should cause it to be analyzed unambiguously as clausal coordination and block the wide scope reading. This prediction appears to obtain. In a context like (42a) where only the wide scope reading can be true, an example like (42b) appears to be false.²

- (42) a. Context: James and Mary always eat together, and share what they're eating. Consequently, they arrange their meals such that each of their dishes will complement the other. Chili and caviar do not go well together, and so while James did order the caviar, Mary did not order the chili.
- b. Sentence: Caviar, James didn't order and chili, Mary.
- c. \rightarrow [False]

²Examples like (42b) could in principle also be analyzed as instances of VPE with exceptional AUX-deletion (perhaps applying before the auxiliary moves to T), but their distributional properties are more similar to Gapping—they cannot be embedded or subordinated—and they will be treated as special cases of Gapping here and throughout.

[i]

- a. * Caviar, James didn't order although chili, Mary.
 b. * Caviar, James didn't order and I suspect chili, Mary.

- d. *Wide scope: It's not the case that James ordered caviar and Mary ordered chili. [True]
 e. Distributive scope: James didn't order caviar and Mary didn't order chili. [False]

This is predicted by the hypothesis that the wide scope reading of Gapping results from low, approximately *vP*-sized coordination and the distributive scope reading arises from clausal coordination, provided English does not have positions targetable by topicalization lower than the CP domain.

Johnson (2009) observed that in Gapping, it is possible for the left conjunct's subject to take bind into the right conjunct (*cross-conjunct binding*, 43a), a possibility that is excluded in conjoined clauses (43b).

- (43) a. No woman_i will drink coffee and her_i husband, tea.
 b. *No woman_i will drink coffee and her_i husband will drink tea.

In small-conjunct structures like (37), this is unsurprising, since the subject in Spec,TP C-commands the entirety of both conjuncts. If topicalized remnants are only allowed in large-conjunct Gapping, like (39), then they should be incompatible with cross-conjunct binding, as appears to be the case (45). This supports the assumption that independent topicalization within each conjunct is inconsistent with a small-conjunct structure for Gapping.³

- (44) No woman₁ can join the Army and her₁ girlfriend the Navy.
 a. No woman₁ can [_{vP} join the Army] and [_{vP} her₁ girlfriend ~~join~~ the Navy]
 b. * [_{CP} No woman₁ can join the Army] and [_{CP} her₁ girlfriend ~~can join~~ the Navy]
- (45) * The Army, no woman₁ can join and the Navy her₁ girlfriend.
 a. * [_{CP} [_{DP2} The Army, no woman₁ can join *t*₂] and [_{CP} [_{DP3} the Navy] her₁ girlfriend ~~can join~~ *t*₃]

The same point can be illustrated using Condition C of the Binding Theory. In a small conjunct structure supporting ATB extraction from both Gapped and antecedent conjunct, such as (46a), coreference between the left conjunct subject and an R-expression in the right conjunct is degraded, at least relative to its status

³Johnson's ATB-movement account of Gapping, the verb's movement to evacuate the right conjunct is obligatory, accounting for the absence of 'un-Gapped' low coordination with *in situ* right conjunct subjects. On a deletion account of Gapping, one might wonder why small-conjunct coordination with the right conjunct's subject *in situ* is unacceptable without deletion; in section (2.4) below I propose that exactly this configuration is attested.

in an example containing independent topicalization (46b). This is precisely what we would expect on the hypothesis that Gapping is syntactically ambiguous between a large and small conjunct structure.

- (46) a. *What did she_i write a book about and Mary_i's girlfriend a play about?
 b. A book about linguistics, she_i wrote, and a play about family secrets, Mary_i's girlfriend.

2.1.0.3. ATB topicalized non-remnants. If independent topicalization in each conjunct can be taken as evidence that the conjuncts are large enough to each contain its own CP, then conversely, topicalization Across-The-Board (ATB) from both conjuncts at once may indicate that the conjuncts are small enough to share a CP. Thus in contrast to examples with independent topicalization in each conjunct, when topicalization has applied ATB from both conjuncts, only the wide scope reading of scopal material should be available. (47), for example, should have only the structure (47c), corresponding to (47a).⁴

- (47) Mary, James didn't give a cupcake to or Bill a box of chocolates.
- a. $\neg(p \vee q)$
 b. $\Rightarrow \neg p \vee \neg q$
 c. Mary, James didn't [_{vP} give a cupcake to] and [_{vP} Bill [_{vP} give] chocolates]
 d. * [_{CP} Mary, James didn't give a cupcake to] or [_{CP} Bill [_{IP} give to Mary] chocolates]
 e. James and Bill typically give their colleagues a cupcake and a box of chocolates on their birthday. Mary and Jane share a birthday, and Jane received two presents, one from James and one from Bill. Mary, though, only had one present on her desk; she certainly didn't receive both a cupcake and a box of chocolates, but it is clear that she received one or the other.

Because the distributive reading of (47) is entailed by the wide scope reading (47b), constructing a context in which only the distributive reading is true can be used to test whether such a reading is available. In a context like (47e), the example appears to be false. Thus it seems that ATB topicalization rules out distributive scope interpretations, as predicted if these interpretations result from coordination of clause-sized conjuncts. Example (48) makes the same point with the modal *can*.

⁴This line of reasoning requires the additional assumption that some scopal parallelism principle would require *to Mary* to move in the right conjunct of an attempted small conjunct structure for (47) like (47d); cf. Fox (1999) for a similar proposal regarding VPE.

- (48) a. Context: Kim and Pat have recipes for egg dishes: Kim's omelette requires only two eggs, and Pat's single serving frittata also requires only two eggs.
- b. Sentence: With two eggs, Kim can make an omelette and Pat a frittata.
- c. \rightarrow [False]
- d. Wide scope: With two eggs (total), Kim can make an omelette and Pat can make a frittata. [False]
- e. *Distributive scope: With two eggs, Kim can make an omelette and with two eggs, Pat can make a frittata. [True]

If examples like these, with ATB topicalization from both conjuncts of a Gapping construction indeed arise from small-conjunct structures, then this predicts that the cross-conjunct binding phenomenon attested in small-conjunct structures should be unaffected by the ATB topicalization. This prediction is borne out: (49) admits of the bound reading where *no woman* binds the pronoun *her* in the Gapped conjunct.

- (49) From the Navy, no woman₁ can receive a level I clearance and her₁ girlfriend a level III clearance.
- a. No woman₁ can [_{vP} receive a level I clearance] and [_{vP} her₁ girlfriend ~~receive~~ a level III clearance]
- b. * [_{CP} No woman₁ can receive a level I clearance] and [_{CP} her₁ girlfriend ~~can receive~~ a level III clearance]

Thus it appears that small-conjunct structures for Gapping correlated with wide-scope readings and can be reliably diagnosed by ATB topicalization, and likewise that large-conjunct structures as diagnosed by independent topicalization in each conjunct yield distributive scope interpretations.

2.2. Small- vs. large-conjunct Gapping and Tense in English

The small- and large-conjunct structures for Gapping alluded to above differ in their sensitivity to Tense in English. This can be seen most clearly when the right Gapping remnant is a temporal modifier, since it is difficult to construct other examples where a tense mismatch between the Gapped and antecedent constituent is unambiguous. Note that inserting a prosodic break after *today* in (50) causes serious degradation.

(50) John can't leave today and Mary yesterday.

$\neg\Diamond[\phi\&\psi]$

$**[\neg\Diamond\phi]\&[\neg\Diamond\psi]$

That this difference is structural is supported by the fact that small-conjunct diagnostics such as cross-conjunct binding (51) are compatible with tense-mismatched Gapping, while large-conjunct diagnostics, such as fronted remnants (52), are incompatible.

(51) No woman_i can leave today and her_i daughter yesterday.

(52) * Today, John can't leave and yesterday Mary.

Similarly, Condition C effects (53) indicate that tense-mismatch is restricted to small-conjunct Gapping, where the left conjunct subject C-commands into the right conjunct.

(53) a. ? He_i can't eat beans and John_i's wife rice.

b. * He_i can't leave today and John_i's wife yesterday.

That tense is relevant to the acceptability of a Gapping example is rather less surprising than that agreement mismatch is (sometimes, as discussed below), due to the overall rarity of agreement-related restrictions in Ellipsis generally. That large-conjunct Gapping disprefers tense mismatch is in line with the research consensus that the inclusion of a given functional head (in this case T) inside an ellipsis subjects it to the ellipsis-antecedent identity requirement, as in (Merchant, 2008a)'s account of voice mismatch.

But it is perhaps surprising that small-conjunct Gapping (at least better) tolerates tense mismatch.⁵ This is because, while in large-conjunct Gapping there are by hypothesis two independent T heads capable of carrying independent Tense specifications, in small-conjunct Gapping there is only a single T head C-commanding both the Gapped and antecedent conjunct.

Tense differs from other syntactic features considered in the literature on ellipsis-antecedent mismatch (e.g. agreement, here, and voice in Merchant 2008a) in that it has unambiguous semantic content that is not duplicated elsewhere in the clause. Agreement features expressed on the verb are dependent upon those of the subject, and voice does not generally alter the semantics of the predicate (though its influence on the scope of quantificational arguments has been noted since Chomsky 1957).

⁵This is somewhat analogous to the German LPE case discussed below in section 2.5.3.

This then indicates a possible way of accounting for the relative acceptability of Tense mismatch in small-conjunct Gapping vs. its relative unacceptability in large-conjunct Gapping. Provided that T can satisfy its requirement to match its Tense feature by valuing the tense of only one of a pair of coordinated verb phrases in its complement, it should be possible for T to supply a tense feature to the left verb phrase conjunct and leave the right conjunct unspecified. (The fact that verbal roots can occur in untensed constructions like infinitives and gerunds suggests that the verbal root itself does not cause a derivational crash if it fails to be specified for tense.) That this is possible in general is indicated by the acceptability of examples like (54a), in which two VPs are coordinated and share a subject (and thus, presumably, a TP), but can differ in tense specification. On the assumption that coordination is asymmetric, with (at least in English) the left conjunct being structurally higher (Munn, 1993; Zhang, 2010), it is unsurprising that this kind of mismatch is less acceptable when the marked tense value occurs in the right conjunct, since T should probe its closest potential V goal first. (54c) demonstrates that the degradation of (54b) is not attributable solely to the fact that the events referred to in its conjuncts are narrated in reverse-chronological order.

- (54) a. I started yesterday and finish tomorrow.
 b. ?? I finish tomorrow and started yesterday.
 c. I finish tomorrow and I started yesterday.

Conversely, in large-conjunct Gapping, the elided T head in each clause will bear an independent Tense specification. Because these different T heads will bear semantic content, specifying at least a relation between the speech time and the event time (e.g. Partee (1973); Dowty (1979)), they fail to meet the mutual entailment requirement on ellipsis-antecedent identity, and tense mismatch is ruled out in large-conjunct Gapping. This property of tense does not appear to be exclusive to large-conjunct Gapping; multiple-remnant sluicing also appears somewhat better with matched tense specifications between elided and antecedent clause, as noted for Spanish by Depiante & Hankamer (2008). This is expected if the semantics of the T head is in principle subject to the ellipsis-antecedent identity requirement.

- (55) a. ?? John took the garbage out today, but I don't know who tomorrow.
 b. John took the garbage out today, but I don't know who yesterday.

2.3. Vehicle Change in Gapping

Another argument that Gapping is derived by ellipsis rather than by ATB movement comes from the presence of *vehicle change* effects in Gapping, which has not been noticed before, to my knowledge.

Vehicle change (Fiengo & May, 1994) refers to cases in which, for Binding theoretic reasons, an ellipsis must be understood as containing a pronoun, even though its antecedent contains a proper name in the corresponding position. A simple example of vehicle change is given in (56). If the VP-ellipsis in (56a) contained the R-expression *Mary* under total identity with its antecedent, it would be predicted to yield a Condition C violation, as in the unelided counterpart (56b), contrary to fact.

- (56) a. John realized $Mary_i$ was sick before she_i did.
 b. * John realized $Mary_i$ was sick before she_i realized $Mary_i$ was sick.

Vehicle change is (*pace* Safir 1999) normally understood to be a property of ellipsis phenomena. Vehicle change effects of exactly this kind can be observed in Gapping as well, as shown in (57).⁶ The Gapped example in (57a) is not entirely natural sounding, probably due to the general awkwardness of pronoun remnants in Gapping, but it is substantially better than the unelided counterpart (57b)

- (57) a. ? John said $Mary_i$ prefers vodka, but she_i herself, gin.
 b. * John said $Mary_i$ prefers vodka, but she_i herself said $Mary_i$ prefers gin.

If Gapping is derived by ellipsis, the possibility of vehicle change effects in Gapping is predicted.⁷ If it is derived by ATB-movement, in contrast, their presence here is difficult to explain, since ATB-movement (and movement more generally) does not normally allow vehicle change (58).

- (58) * Whose $_i$ mother does John like and she_i hate?

2.4. SubGapping

Gapping is often conflated with the superficially similar construction in (59), in which only the finite auxiliary, rather than all verbal material, has gone missing in the right conjunct. At first glance, English

⁶These examples use cross-clausal or *Long-Distance Gapping*, for which see e.g. Steedman 1990, Lechner 2001, Grano 2015, and the discussion in Chapter 4 below; Long-Distance Gapping is not acceptable for all speakers, but those who accept it appear to get the contrast in 57.

⁷An explanation for why vehicle change effects occur in ellipsis is beyond the scope of this remark, but see Merchant 2001:204 for one possibility.

subGapping appears problematic for an ellipsis theory of Gapping. In this section, I argue that subGapping in English in fact provides rather good evidence for an ellipsis theory of Gapping. I contend that the differences between English subGapping and Gapping are explicable if subGapping is derived via ATB-movement, as on a Johnson-style analysis of Gapping, while Gapping itself involves ellipsis. subGapping differs from Gapping in its inability to support interpretation of low adverbs in the right conjunct and in its interaction with Voice in ways that are consistent with subGapping being non-elliptical and Gapping elliptical. Furthermore, when subGapping and Gapping are interspersed in a single example, the pattern of large- and small-conjunct interpretations is what is predicted if subGapping does not involve ellipsis (and lacks a large-conjunct parse) while Gapping is elliptical and large-/small-conjunct ambiguous.

(59) John can't go out and Mary stay at home.

Such structures resemble Gapping, beyond the absence of the auxiliary and the presence of overt material flanking the position AUX would occupy if it were present, in having a similar characteristic prosodic contour and being subject to the no-subordination and no-embedding constraints (60, 61).

(60) a. * John can't go out although Mary stay at home.

b. * John can't go out when Mary stay at home.

c. * John can't go out because Mary stay at home.

(61) * John can't go out and I suspect that Mary stay at home.

Potter et al. (under revisions) refer to these constructions as *subGapping* to distinguish them from canonical Gapping constructions, following the practice of Lechner (2001).⁸

Note that in an example like (59), it is not obvious that there is any *constituent* to be deleted corresponding to the string *can't*. If the two morphological elements of *can't* are assigned to separate syntactic terminals, they will most likely be in a configuration like (62), in which the negative element *n't* is either the Specifier or head of a NegP in the complement of the TP (or whatever IP-domain projection is headed by *can*, possibly a ModP).

⁸The term appears to be originally due to Maling (1972). However, the configuration that she and the subsequent literature on German differs from the English one in several respects, and I make no claim as to whether or how straightforwardly the account presented here can be extended to that language.

(62) ... [_{TP} can [_{NegP} n't ...

Instead however, they may be best analyzed as a single (derived, complex) head. The most obvious evidence for this is their ability to undergo T-to-C movement together, as in (63).

(63) Can't John go out and Mary stay at home?

But in this case, it is generally agreed that ellipsis must apply to maximal projections (Lasnik, 1999), not to heads in isolation⁹. Thus on neither analysis is it obvious that there is anything deletable in the right conjunct to derive an example like (59). In contrast, the movability of the auxiliary is unquestionable. This appears problematic for an ellipsis approach to Gapping, given the overall similarity of subGapping to it.

A further problem that subGapping presents for a deletion analysis of Gapping is that, on an analysis like the one in Potter et al., subGapping would have to result from deletion in clause-sized conjuncts. This is because in *vP*-sized conjuncts, there should be no position for the missing material *can't* to have been deleted from. But subGapping behaves in many other ways like putatively small-conjunct Gapping: in particular, it admits cross-conjunct binding (64). This should be impossible in clause sized conjuncts, as it generally is in straightforward cases of Gapping.

(64) No woman_i should go out and her_i girlfriend stay at home.

In the remainder of this section I present evidence that subGapping in English is not in fact problematic for a deletion account of Gapping, but actually constitutes rather good evidence in its favor. A preliminary observation toward this end is that in one way, Gapping differs substantially from subGapping: the latter does not admit of distributive scope interpretations. That is, an example like (59) does characterize a situation where John is unable to go out and Mary is unable to stay home, regardless of the actions of the other, but rather one in which if Mary stays home, John cannot go out, or vice versa (65).

(65) John can't go out and Mary stay at home.

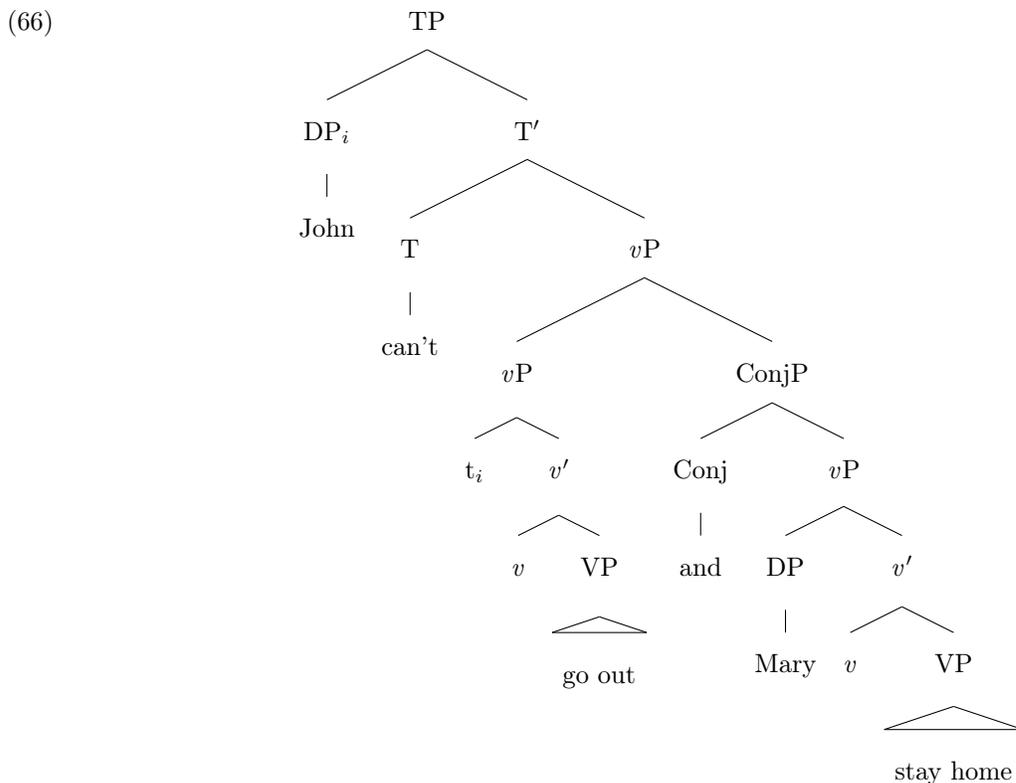
a. $\neg\Diamond((J \text{ go out}) \wedge (M \text{ stay home}))$

b. * $\neg\Diamond(J \text{ go out}) \wedge \neg\Diamond(M \text{ stay home})$

⁹Though see (Williams, 1997) *et seq.* for a contrary view.

This, plus the cross-conjunct binding in (64) above, I take to indicate that subGapping behaves like a small-conjunct test in the terms of Potter et al. (under revisions). The analysis that I put forward in what follows asserts that subGapping is exactly that: the structure of small-conjunct Gapping (in Potter et al.'s terms), but in which no ellipsis has taken place.

These considerations suggest that subGapping has a structure similar to small-conjunct Gapping. It behaves like Gapping in resisting subordination and embedding, and behaves like small-conjunct Gapping in particular in its range of interpretation and in permitting cross-conjunct binding. But the small conjuncts hypothesized for this kind of Gapping are not large enough to accommodate a position for the modal (*can't* in the examples above). I propose instead that the structure of an example like (59) is as in (66): that is, it is exactly the structure hypothesized for small-conjunct Gapping, but with no deletion.¹⁰



¹⁰Note that on an analysis of this kind, subGapping, but not Gapping, is independently predicted to be possible based on the independent property of the English verbal system that VPs can be conjoined under a single auxiliary, provided two additional hypotheses are true: (i) movement of the subject to Spec,TP is not required to Case-license the subject but instead serves only to satisfy T's EPP requirement, whatever its origin, and (ii) A-movement is not subject to the CSC.

It should be noted at this point that the absence of deletion in this configuration, while obligatory in (59) due to the non-identity of the VPs, cannot invariably be attributed to this cause. That is, it cannot be the case that subGapping is ‘failed’ small-conjunct Gapping in the sense that the only reason ellipsis has not applied is because of the verbal non-identity. We can see this from examples like (67), where verbal identity is satisfied, but ellipsis, apparently ‘optionally’¹¹, does not apply.

(67) John can’t eat caviar and Mary eat SPAM.

What this means is that small conjunct configurations of this kind must therefore be assumed to be independently possible. Importantly, if subGapping is just small-conjunct Gapping without the deletion, the fact that it obeys the no-subordination and no-embedding constraints is further evidence that they are not parochial to Gapping itself and may need a wider explanation.^{12,13}

2.4.1. SubGapping and adverbs

If deletion/ellipsis does not apply in the derivation of subGapping examples, this predicts that properties of Gapping that depend upon ellipsis will not obtain in the case of subGapping. The most obvious example of this kind of phenomenon is the ability of low adverbs to be interpreted in both conjuncts in small-conjunct Gapping while only appearing overtly in the left conjunct, as in (68), which, on one interpretation, contains a presupposition failure if the relevant girlfriends have never drunk champagne in the past: that is, the VP-level adverb *again* is interpreted in the right conjunct. Note that the cross-conjunct binding in (68) ensures that it has a small-conjunct structure.

¹¹Presumably this apparent optionality is conditioned by a featural difference in the ellipsis-licensing head.

¹²A similar point is made in Toosarvandani (2013). However, why *large*-conjunct Gapping should obey these constraints is still mysterious, perhaps more so now.

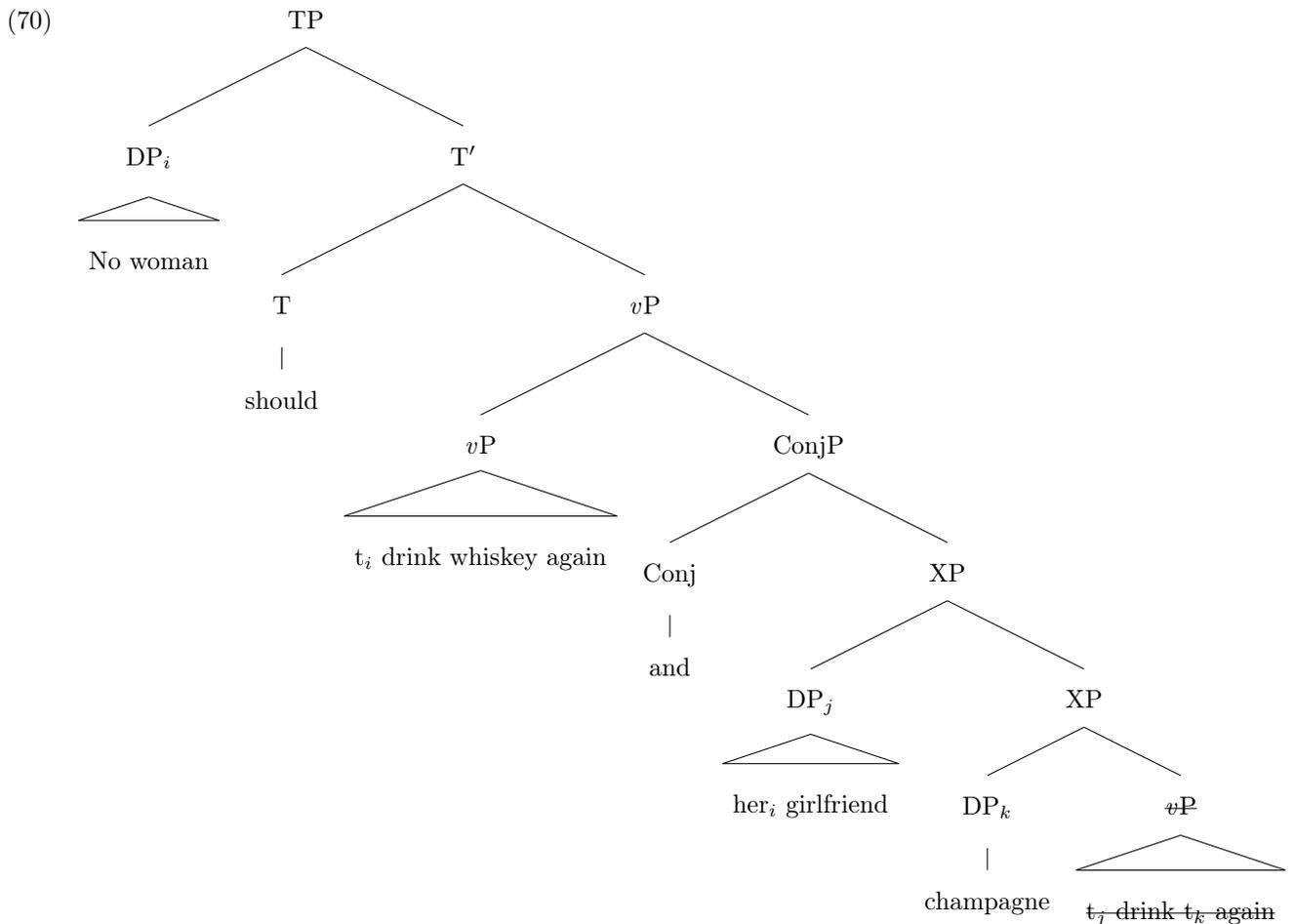
¹³Of course, if both subGapping and Gapping involve ATB verb movement, their obeying these constraints follows from the CSC, as famously proposed in Johnson (2003). Below we will see evidence that, unlike subGapping, Gapping shows evidence of involving deletion even with derived from apparently small conjuncts, whether in also involves ATB-movement or not. Moreover, to reiterate the argument from above: if Gapping’s scope ambiguity is best accounted for by a conjunct-size ambiguity, an ATB explanation for these constraints cannot be the whole story because such an account is unfeasible for clausal coordination. This is because it would require verb movement into CP and subsequent CSC-violating movement of all the left conjunct’s constituents to the left of the verb to higher positions in the CP layer in order to derive the correct word order. This would obviate the principal selling point of such an analysis (*viz.* deriving Gapping’s distributional restrictions from the CSC) by requiring a systematic weakening of the CSC to account for distributive scope Gapping readings. That said, the similarity of Gapping’s distributional restrictions to those on ATB movement is extremely suggestive, and an account of these restrictions that derived them from ATB movement of a null focus operator over a pair of (clause or verb phrase) constituents may be worth exploring. For the moment, I assume the validity of the above arguments in favor of a structural ambiguity for Gapping examples and remain agnostic on the source of these two structures’ restriction in common to coordination.

(68) No woman_i should drink whiskey again and her_i girlfriend champagne.

In contrast, when the example is an instance of subGapping, it appears that this interpretation is not available. That is, the adverb *again* is unable to ‘go missing’ if the main verb has not gone missing as well.

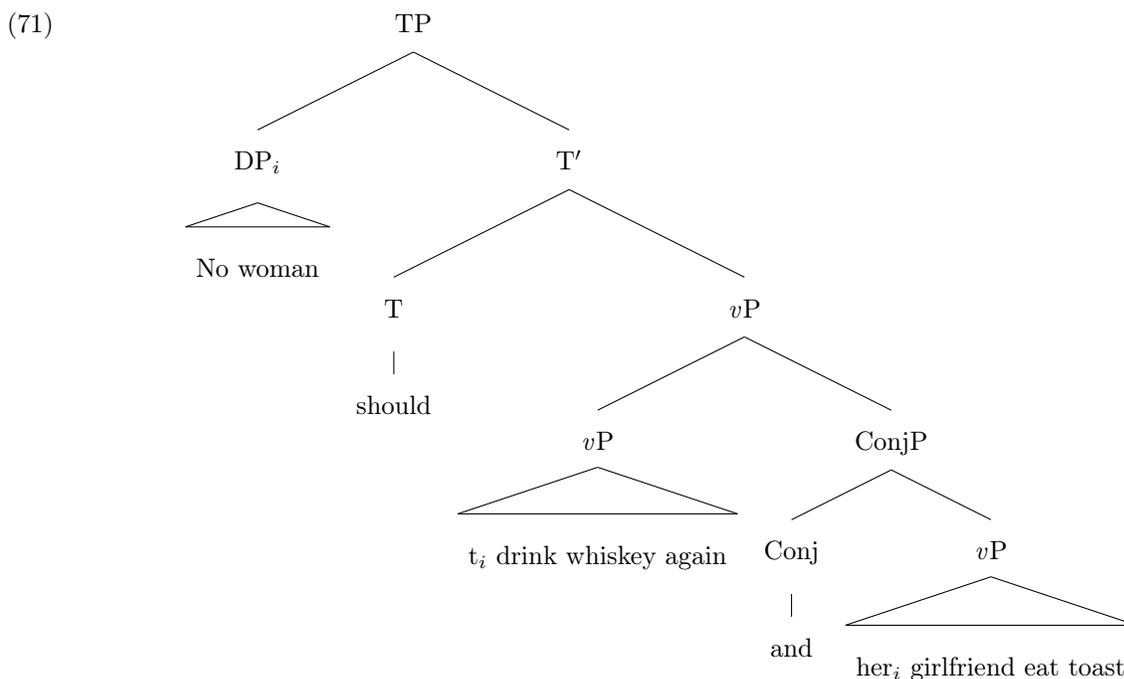
(69) No woman_i should drink whiskey again and her_i girlfriend eat toast.

This is *prima facie* evidence for the account of subGapping offered here: if subGapping is the same syntactic structure as that of small-conjunct Gapping but with no deletion, the inability of low adverbs to be interpreted in the right conjunct without appearing there overtly is predicted. The reasoning for this is as follows. A Gapping example like (68) will have a structure like (70).



In contrast, if a subGapping example simply lacks an ellipsis site, but is otherwise structurally equivalent to small-conjunct Gapping (71), the inability of *again* to be interpreted in the right conjunct in examples like

this is of a piece with the other constellation of properties subGapping shares with small-conjunct Gapping. In the absence of deletion in the right conjunct, there is only one instance of *again* in the structure, and it is interpreted modifying the conjunct to which it is adjoined.



The same point can be made with low manner adverbs, which are also merged inside *vP*, (Potsdam, 1998; Ernst, 2002). In these contexts the contrast in interpretations may be more pronounced and the judgments concomitantly easier. Low manner adverbs in Gapping must be interpreted as modifying each conjunct independently Jackendoff (1971), which follows if there is no structure for Gapping in which less than a *vP* is coordinated.

- (72) a. John can quickly drink beer and Mary champagne.
 b. John can quickly drink beer and Mary drink champagne.
 c. John can quickly drink beer and Mary quickly drink champagne.

Although the former, Gapping example permits a reading where *quickly* is interpreted as modifying both *drink beer* and *drink champagne*, the latter example excludes such a reading, and is necessarily agnostic about Mary's rate of champagne-drinking. This, again, follows if there is simply no deletion in subGapping.

The same pattern obtains for 'adverbial' negation, which is also merged very low (Jackendoff, 1969).

- (73) a. James shouldn't not cook dinner and Mary dessert.
 b. James shouldn't not cook dinner and Mary order takeout.

While the former example can only mean that Mary also shouldn't **not** cook her respective dish (Potter et al., under revisions), the reading with distributive scope of *not* is excluded for the latter example. It cannot mean that Mary shouldn't **not** order takeout, and can instead only mean that she shouldn't order takeout. This is entirely predicted if small-conjunct Gapping involves deletion of an approximately *vP* sized constituent and subGapping simply involves no deletion.

2.4.2. Gapping and subGapping interspersed

When Gapping and subGapping apply alternately to a series of conjuncts, the relative order of Gapping and subGapping condition the possible scope interpretations. The range of interpretations available accords exactly with an account on which Gapping is ambiguous between a clausal coordination and a VP-coordination parse but subGapping-type strings arise only in the context of VP-coordination.

Consider the examples in (74). In (74a), a Gapped conjunct (*John rice*) is followed by a subGapped conjunct (*Peter cook lentils*), while in (74b) the order is the opposite, subGapped then Gapped conjunct. The possible scope of the modal+negation *shouldn't* differs between the two examples. In (74a), Peter's obligation to not cook lentils appears contingent on Mary and John's purchasing beans and rice. Importantly, the example can be felicitously followed up with *... Peter should just make the lentils*, indicating that a small-conjunct interpretation is available.

- (74) a. Mary shouldn't buy beans and John rice and Peter cook lentils.
 b. Mary shouldn't buy beans and Peter cook lentils and John rice.

In contrast, (74b) is ambiguous. Its two readings are schematized in (75).¹⁴

- (75) a. Mary shouldn't buy beans and Peter cook lentils and John ~~eat~~ rice.

¹⁴For some speakers it also has a reading equivalent to (14), but as this does not differ from (75b) in any way relevant to the purposes of the argument here, the difference between these readings is elided in what follows.

i. %Mary shouldn't buy beans and Peter cook lentils and John ~~shouldn't buy beans and Peter cook~~ rice.

- b. Mary shouldn't buy beans and Peter cook lentils and John ~~shouldn't buy rice~~ and Peter ~~cook lentils~~.

The interpretation in (75a) is a clear wide-scope reading, where a single complex eventuality—Mary buying beans, Peter cooking lentils, and John cooking rice—is declared to be undesirable, under the scope of *shouldn't*. In contrast, (75b) is a distributive scope reading, in which *shouldn't* takes scope independently in the two conjuncts *Mary shouldn't buy beans and Peter cook lentils* and *John ~~shouldn't buy rice~~ and Peter ~~cook lentils~~*. Each of these conjuncts, however, is itself a conjoined structure containing subGapping, and with respect to the subGapped constituents, each instance of *shouldn't* appears to take wide scope.

When we consider the possible structures of coordination, it becomes clear both why (74a) does not exhibit an ambiguity of this kind and why the ambiguity of (74b) is as limited as it is.

First, (74a) lacks the ambiguity because, if subGapping requires verb phrase coordination and coordination must be of like categories, then because the final conjunct in (74a) is an instance of subGapping, the constituent to its immediate left must also be a verb phrase. This means that the only possible Gapping reading for the second conjunct in (74a) is the small-conjunct reading, and consequently *shouldn't* is constrained to take scope over all three verb phrase conjuncts.

(74b), however, is ambiguous between a reading on which *shouldn't* takes scope over all three conjuncts (75a) and a reading on which it takes scope over the first two together and the third separately (75b). As in (74a), the subGapped conjunct in (74b) must be coordinated with the verb phrase on its left. Consequently *shouldn't* will always take scope over the left two conjuncts together, since the coordination here can only be VP coordination. The rightmost conjunct, however, being Gapping, can be interpreted as coordinated either with the VP to its left, yielding the reading (75a), or with the clause to its left, yielding the reading (75b).

Examples like (74) are quite problematic for an analysis of Gapping based on ATB movement. While the movement of *shouldn't* in (74) can very well be ATB out of all conjuncts, this can hardly be the case for the movement of *buy*. Given that ATB movement must in general be from all the conjuncts in a coordinate structure (Ross, 1967), it is unclear how an ATB analysis of (74) could proceed. In contrast, if Gapping in English is derived via deletion, and if the wide/distributive scope ambiguity results from an ambiguity in the size of the Gapped conjunct, the pattern of interpretation in (74) follows straightforwardly.

2.4.3. Why does subGapping lack a large-conjunct parse?

The preceding discussion in this section has hypothesized that subGapping examples represent small-conjunct coordination exactly like the structure that derives wide-scope interpretations of Gapping proper, and has adduced evidence to this effect. However, a possible objection to this account is that it is not obvious why a large-conjunct parse should be unavailable for a subGapping string. To illustrate this, consider that example (76a) could be imagined to derive from a structure like (76b), in which the subject and the verb phrase have moved into the CP layer and the TP has subsequently been deleted.

- (76) a. John shouldn't eat caviar and Mary eat toast.
- b. [_{CP} John shouldn't eat caviar] and [_{CP} [_{DP} Mary] [_{VP} eat toast] [~~_{TP} _t_{DP} shouldn't _t_{VP}~~]]

Because subGapping strings appear to be unable to receive the distributive scope interpretation that would be expected from such a structure, with two distinct instances of *shouldn't*, the structure in (76b) is apparently not available; the question is why not. Except for the fact that the right remnant is a VP, this is the structure proposed above for distributive scope Gapping. Is there a principled reason to suspect that a VP cannot serve as the right remnant in LCG?

Because topicalization of subjects is independently impossible in unreduced matrix clauses in English (Lasnik & Saito (1992), cf. Chomsky (1986) that this is due to a ban on vacuous movement), evidence about the relative ordering of leftward-moved subjects and VPs is not directly applicable to this question.

However, note that in Gapping, when the left conjunct's subject is an expletive but the remnants and correlates are VP-constituents, LCG does not appear to be available (77). If LCG were available in (77), the follow-up given would be felicitous, but instead it appears that *might* can only take wide scope here. This suggests that, for whatever reason, LCG cannot take two VP constituents as its remnants. This is suggestive, but it does not strictly rule out the possibility of a prior VP-constituent (the subject) and the remnant VP being the Gapping remnants.

- (77) a. There might have been some problems pointed out by John, and some solutions by Mary.
- b. ... #but certainly not both.

From a different angle, there is independent evidence that the EPP may be a PF requirement and does not need to be satisfied in deleted structure (Merchant (2001); Van Craenenbroeck & Den Dikken (2006), and see the discussion below). If so, then at the point at which the C-domain head is merged into the right conjunct, the subject may still be a constituent of *vP*. If this is the case, a focus Probe in the C domain would Probe the strictly closer *vP* before accessing its Specifier, the thematic subject, and only a single movement of the unevacuated *vP* to the clausal edge would be required (or indeed possible). Then an example like (76a) would have a structure like (78).

(78) [_{CP} John shouldn't eat caviar] and [_{CP} [_{VP} Mary eat toast] [~~TP shouldn't t_{VP}~~]]

Indeed, movement of an unevacuated verb phrase is sometimes possible (79).

(79) I thought there'd be bees in the garden, and [_{VP} bees in the garden] there were t_{VP}.

What rules out (78)? Possibly the Gapping-related E-feature-bearing head obligatorily bears two focus features, and after the raising of VP there are no further constituents in its complement for it to target. The properties of Stripping, which leaves a single remnant, are broadly similar to those of large-conjunct Gapping. If a derivation involving movement of a single unevacuated VP to the left periphery followed by clausal ellipsis is possible, something like large-conjunct subGapping may be licensed in an environment in which Stripping is acceptable and Gapping is not; for instance, after *but not*. This, however, does not appear to be possible either (80).

(80) * John should eat caviar, but not Mary eat toast.

However, thematic subjects are independently unable to occur in moved active transitive VPs in English. While a thematic subject can remain *in situ* in passive clauses (81), it is not compatible with VP movement (82).

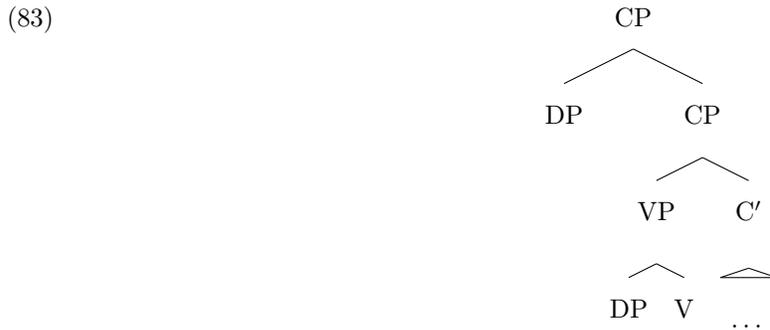
(81) There should have been someone arrested by the police.

(82) * There should have have been someone arrested by the police, and indeed someone arrested by the police there was.

This, then, may be the origin of the unavailability of a structure like (78). Still, however, the unavailability of (76b) requires some explanation. Even if the EPP does not *need* to be satisfied in unpronounced structure,

it is conceivable that the subject DP may sometimes move out of *vP* prior to ellipsis anyway. Indeed, if our conclusion from (77) is correct, that two constituents of *vP* cannot be LCG remnants, the availability of normal LCG with a subject remnant indicates that it must be possible for the subject to leave *vP* before the ellipsis-licensing head is introduced.

Why, then, can a subject and a verb phrase not be the remnants of a large-conjunct Gapping configuration, yielding a subGapping-like string with distributive scope? One key difference between this pair of remnants and the more typical DP+DP or DP+PP remnants in Gapping is that, when a verb phrase and a subject are the Gapping remnants, one remnant (the VP) will contain a trace of the other. If both of the remnants are located in the CP phase edge, they will be linearized together, and the presence of a moved DP and its trace/lower copy in the same phase edge (83) may cause problems for the linearization algorithm if they are insufficiently distinct (see Richards 2006 for discussion of insufficient distinctness of multiple elements yielding linearization failure).



There are several issues to work out with this suggestion, but to begin with, there is some suggestive evidence that Gapping degrades when one remnant contains the trace of another from the different behavior of control vs. raising infinitives as remnants (84).

- (84) a. I expected John never to go to the office and Mary to stay at home.
 b. I persuaded John never to go to the office and Mary to stay at home.

Both examples in (84) have as their most accessible reading a simple coordination structure in which *John never to go to the office* and *Mary to stay at home* are coordinated under *expected*. In (84a), a reading is possible in which *never* scopes over the two conjuncts such that the state of affairs that the speaker expects never to obtain is approximately *John is in the office and Mary has stayed at home*. Such a reading appears

not to be available for (84b); *never* most naturally modifies only the first conjunct. This difference is expected on a fairly traditional view of the difference between control and raising (to object), i.e. one following the basic outline of Rosenbaum (1967). In particular, if raising to object predicates involve movement of a subject (in this case *John*) from the embedded clause into the matrix clause, while control predicates do not involve such a movement, it will be possible for *never* to be adjoined to the pair of coordinated TPs in the complement of *expected* in (84a) and not in (84b).

Assuming that the traditional account of the distinction between control and raising predicates is correct, then the raising to object infinitive in (84a) will contain a trace of the DP *John* in subject position, while the object control infinitive in (84b) will contain the unpronounced anaphoric element PRO. If the proposal above that one Gapping remnant cannot contain the trace of another is on the right track, then, a Gapping reading may also be available for (84b), but not for (84a). Given that the conjuncts must, containing the infinitive marker *to*, be too large to be verb phrase coordination, the relevant Gapping would be of the large-conjunct type, and *never* would take distributive scope, i.e. be interpreted independently in each conjunct. Such a reading does not appear to be possible for (84a)—it does not appear to be able to mean that the speaker expects John to absolutely never be in the office and Mary never to stay at home. This is as expected if one Gapping remnant cannot contain the trace of the other. Instead, in (84a), if *never* fails to take wide scope, it is interpreted only in the left conjunct, and the speaker is reporting similar expectations for John and Mary: that John never goes to the office, and that Mary stays at home.

(84b) is, as stated above, most natural on a reading where only the left conjunct is modified by *never*. But a reading where *never* modifies each conjunct independently—so that the speaker persuaded John never to go to the office, and persuaded Mary never to stay at home—is at least marginally possible for some speakers, provided *never* bears a pitch accent and *Mary* bears a falling tone and is followed by a slight pause. These prosodic manipulations do not appear to improve a distributive-scope reading for (84a). The absence of a Gapping reading for (84a) and the marginal possibility of one in (84b) is consistent with a constraint against one Gapping remnant containing the trace of the other, but because the Gapping reading of (84b) is not particularly accessible or stable, the argument is suggestive at most.

Another reason to suspect that the inability of subGapping strings to have a large-conjunct, distributive-scope interpretation results from an externalization conflict due to one remnant containing the trace of the other, however, may be more convincing.

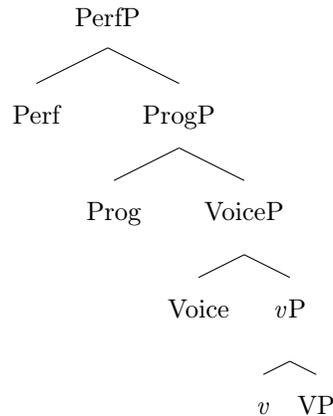
The generalization about subGapping as presented above was that subGapping examples simply lack a distributive scope interpretation. For the examples considered above, this is correct, but it is incomplete. In particular, there is a class of subGapping examples for which a distributive scope reading is possible, as exemplified in (85). What is true of these and similar examples of subGapping that admit of a distributive scope interpretation that distinguishes them from the examples considered above is that in subGapping-type strings that admit of a distributive-scope interpretation, the verb in the right conjunct occurs in a non-bare form, with either the suffix *-ing* or *-en*.

The true generalization thus appears to be that subGapping strings lack a distributive scope interpretation when the verb is in the bare form, but admit of such an interpretation when the verb is in the *-ing* or *-en* form.

- (85) a. John might have been attacked by wolves and Mary, mauled by bears.
- b. John might have been eating nattou and Mary, drinking sake.
- c. ? John might have eaten nattou and Mary, eaten sashimi.
- d. ...but not both.

If the problem with (bare-form) distributive-scope subGapping results from a linearization problem resulting from the presence of a trace of the first remnant inside the second remnant, there is a ready explanation why the inability of such examples to allow distributive scope readings of scope-taking elements in the left conjunct does not extend to similar examples, such as those in (85), in which the verb bears aspect or voice marking. Assuming that the aspect and voice morphemes in English are introduced in a series of functional projections as in (86), and that these morphemes are introduced onto the verb (via ‘affix-hopping’ or some equivalent) under c-command, movement of a verb phrase whose verb carries voice or aspect marking could not occur before these projections are introduced.

(86)



So long as the lower phase (whether VoiceP or *v*P) has already undergone Spellout before the verb phrase remnant in distributive-scope ‘subGapping’ examples like (85) fronts, which it must have, given that it bears *-ing* or *-en* marking from higher functional projections, the linearization of the trace of the subject inside it will already be fixed relative to its other contents, and will not interact with the other instance of the subject (viz. the other Gapping remnant). If the aspect- and voice-introducing projections are not present in the absence of marked aspect or voice, the structure of a bare-form verb phrase will not include them, and consequently there will be no phase boundary above the trace of the subject in a fronted bare-form verb phrase. Once the verb phrase fronts, then, all of its contents will have to be linearized relative to the other (subject) remnant, and the trace of the subject inside the moved verb phrase will not be distinct from the subject remnant for linearization purposes. If this is the case, then the lack of a distributive-scope reading for subGapping strings with a bare verb form in the right conjunct follows from the fact that in a structure like (83) there is no phase/linearization boundary present between the different copies of the subject remnant, and so an example like (76b) will be unable to receive a coherent set of linearization statements.

2.4.4. SubGapping and Voice

Unlike Gapping (87a, from Johnson), subGapping tolerates voice mismatch between the subGapped clause and its antecedent (87b).

- (87) a. *Some brought roses and lilies by others
 b. No one_i should receive punishment and his_i accomplice be forgiven.

This is evidence that either small-conjunct Gapping involves coordination of categories small enough that they share a Voice head, or it involves deletion of a category large enough that it includes the Voice head. This is not a surprising conclusion, given that voice-mismatched verb phrases can be coordinated in general (Burton & Grimshaw, 1992; McNally, 1992). It may be more parsimonious to assume that the latter analytical option is the case, on analogy with Merchant (2008a)'s account of PseudoGapping. On such an account, the ellipsis remnants land in a position above Voice, and the Voice head is subject to the ellipsis-antecedent identity requirement, just as in PseudoGapping. On the other hand, this observation does not conclusively serve to distinguish between deletion and ATB-movement analyses of Gapping, because on the ATB-movement account, the Voice head may be contained in the ATB-moved constituent in Gapping and not in SubGapping, predicting the same pattern of Voice mismatch.

Interestingly, although voice mismatch is possible when a modal auxiliary is shared in subGapping (87b), the same is not the case when what is shared is a form of *be*. Auxiliary *be* supports both the passive and the progressive in English, and while it can subGap either the passive or the progressive, mismatching the two is illicit (88).

- (88) a. *Mary was eaten by bears and John watching helplessly.
 b. Mary was eaten by bears and John nauseated by the spectacle.
 c. *Mary was eating nattou and John nauseated by the spectacle.
 d. Mary was eating nattou and John watching helplessly.

While I do not have an explanation for why examples like those in (88) are more degraded than equivalent examples with a shared subject (89), the paradigm in (88) suffices to show that equivalency of morphological form is not sufficient to license subGapping, and, more importantly, that even under a large-conjunct parse (which should be available for examples like (88) given the discussion in the previous section) in which ATB movement of the auxiliary need not occur, the different featural specifications of the *be* auxiliary count as distinct for the purposes of ellipsis-antecedent identity calculation. Below in section (3) we will see further evidence that the forms of English *be* count at least sometimes as non-identical for the purposes of this identity relation.

- (89) Mary was eaten by bears and watching helplessly.

2.5. Gapping and left-peripheral ellipsis

Another elliptical construction that bears notable similarities to Gapping is what has been called *Left-Peripheral Ellipsis* (LPE) (Sag 1976, Agbayani & Zoerner 2004). While Gapping prototypically eliminates the middle portion of a clause, sparing a subject and a non-subject remnant, LPE (as the name implies) eliminates the verb and material to its left, sparing potentially multiple non-subject remnants.

- (90) a. Gapping: John gave a book to Mary and David ~~gave a book~~ to Peter.
 b. LPE: John gave a book to Mary and ~~John gave~~ a scarf to Peter.

LPE is similar to Gapping in a number of aspects of its external syntax. In particular, it is degraded in subordinate and embedded environments, just as Gapping is.

- (91) a. John gave a book to Mary and a scarf to Peter.
 b. * John gave a book to Mary although a scarf to Peter.
 c. * John gave a book to Mary and I think that a scarf to Peter.

2.5.1. Two structures for LPE

Like Gapping, LPE appears to be ambiguous between large-conjunct and small-conjunct structures. In the remainder of this subsection I present arguments from topicalization and ATB movement to the effect that LPE, like Gapping, exhibits a structural ambiguity between approximately clause-sized and approximately VP-sized conjuncts. We will see later that there is some reason to conclude that the precise size of the small and large conjuncts differs slightly from those of small- and large-conjunct Gapping.

First, observe that like Gapping, LPE appears to permit an ambiguity in the scope of negation, modals, and other scopal elements relative to the coordination.

- (92) a. John didn't give a scarf to Mary and a pair of socks to David.
 b. ... he gave them both scarves.
 c. ... although he had planned to, he forgot and found the packages in his closet after Christmas.

An example like (92a) can denote either the denial of the conjunction of two propositions (*It is not the case that John gave a scarf to Mary and John gave a pair of socks to David*) or a conjunction of two

independently negated propositions (*It is not the case that John gave a scarf to Mary and it is not the case that John gave a pair of socks to David*), as indicated by the potential continuations. Crucially, the continuation in (92b) is contradictory to the latter, distributive scope reading, but appears to be a possible continuation of (92a). This suggests that a small-conjunct structure is available for LPE.

- (93) a. We can't introduce John to Big Lou or Mary to the police.
 b. ... either way would result in our getting caught.
 c. ... but one of the introductions has to happen; we don't know which.

In an example where instead the wide scope reading entails the distributive, such as the combination of a negated possibility modal and disjunction (93a), it is possible to show that the distributive reading is available for LPE as well. (93c) contradicts the wide scope reading of (93a), but not the distributive scope, and appears to be a possible continuation. This, then, suggests a large-conjunct structure is available for LPE, on analogy with the Gapping argument outlined above.

2.5.1.1. Topicalization. In LPE, as in Gapping, it is possible to apply topicalization independently in each conjunct (94).¹⁵

- (94) To Mary, John gave a book, and to Susan, a picture.

On analogy with the Gapping facts, we expect independent topicalization to depend upon the availability of a CP domain in the right conjunct. Thus it should force a large-conjunct structure and, concomitantly, a distributive scope interpretation. Thus an example like (95a) should correspond to a conjunction of negated propositions and not a negation of conjoined propositions. If this is the case, it should be infelicitous when followed by a continuation that contradicts either negated proposition, even if such a continuation is consistent with the negation of both propositions together. (95b) is one such continuation, and it does appear to be an unacceptable continuation for (95a). This, then, supports the hypothesis that distributive scope readings in LPE, as in Gapping, arise from coordination of clauses.

- (95) a. To Mary, John didn't give a book, and to Susan, a picture.
 b. *... he gave them both books.

¹⁵That this is possible in Gapping as well is contra the assertion in Frazier et al. (2012); examination of more examples has shown that Gapping does at least sometimes tolerate this kind of inversion.

If cross-conjunct binding requires small-conjunct structures, it should be excluded in LPE with independent topicalization just as in Gapping. This prediction is borne out; (96) appears not to permit a bound reading of the pronoun *her*, as predicted if the only possible structure for that example involves clausal coordination.

- (96) To Mary, no woman_{*i*} gave a book, and to her_{*j*/**i*} daughter, a picture.

2.5.2. Spray/load alternators

In spite of the many apparent similarities of LPE and Gapping, there is at least one context in English in which they pull apart sharply (for a subset of speakers). This is in the environment of verbs that take variable internal argument-structure configurations, in particular the so-called *spray/load* class.

Spray/load alternating verbs take two internal arguments, approximately a theme and a location, which are realized syntactically as an NP and a PP. They admit of two different configurations of these arguments, a theme-NP/location-PP configuration (the *in-* or *on-*frame 97a) and a location-NP/theme-PP configuration (the *with-*frame 97b), with subtle interpretational differences (see Levin & Rappaport 1988, etc., for an overview).

- (97) a. Mary sprayed cleaner on the window.
 b. Mary sprayed the window with cleaner.

A notable property of *spray/load* alternating verbs in English is that they are potentially ambiguous between Gapping and LPE.

- (98) a. Peter loaded the van with packages and ~~Peter loaded~~ David with boxes.
 b. Peter loaded the van with packages and David ~~loaded the van~~ with boxes.

In examining the different behavior of LPE and Gapping with regard to *spray/load* alternators, we will consider examples in which rightmost remnant is a PP, as in (99,100). In such examples, an LPE parse is available even if the argument-structures of the two conjuncts must differ; that is, even when the antecedent contains the *with-*frame and the elided conjunct the *in-*frame, or vice versa.¹⁶

¹⁶This is true for at least some English speakers, notably not including the author.

- (99) a. The boy loads the van with packages and the man in the truck.
 b. ...and loads the man in the truck. (LPE)
 c. *...and the man loads packages in the truck. (Gapping)
- (100) a. The boy loads packages in the van and the man with boxes.
 b. ...and loads the man with boxes. (LPE)
 c. *...and the man loads the van with boxes. (Gapping)

While examples like (99,100) are licit on an LPE reading, a Gapping reading is notably unavailable for them. Thus although Gapping and LPE share similar distributional restrictions and interpretive properties, they must differ in some way.

Note that mismatch in the other direction, where the reduced conjunct contains an NP as its rightmost remnant, is disallowed (101,102).

- (101) a. The boy loads the van with packages and the man the truck.
 b. *...and loads the man (in) the truck. (LPE)
 c. ...and the man loads the truck with packages. (Gapping)
- (102) a. The boy loads packages in the van and the man boxes.
 b. *...and loads the man (with) boxes.
 c. ...and the main loads boxes in the van.

This follows from the general ban on P-stranding in the second remnant of LPE (103, Frazier et al. 2012).

- (103) John gave a wallet to Peter and a scarf *(to) David.

What might differ between LPE and Gapping to account for this difference in the availability of argument-structure mismatch in *spray/load*-contexts? Several classes of solution are conceivable. The identity condition holding between the elided material and its antecedent might differ, being weaker for LPE. This is the least desirable class of solution because of the complexity it introduces into the theory of ellipsis in general; in the best case, the identity conditions for all forms of ellipsis will turn out to be identical. Likewise, the Gapping/LPE difference is ideally derivable in some way from configurational properties of the constructions.

A better possibility would be that, as in Merchant's account of the different availability of voice mismatch between VPE and Pseudo-Gapping, the head controlling the argument structure (*with*-frame vs. *in*-frame) might be (sometimes) excluded from the ellipsis site in LPE but present in it in Gapping. The similarity of the Gapping/LPE difference here to the VPE/PsG difference studied by Merchant makes this possibility initially compelling, but it is unclear what head might be responsible for the *spray/load* argument-structure alternation other than *v*, and if it is *v*, a more elegant solution exists.

Consider that since there is no subject remnant in an LPE construction, it should in principle be possible to coordinate lower than *v*P, on the assumption that *v* is the head whose specifier hosts the base position of transitive and unergative subjects. If this is the case, that LPE can be derived from *very* low coordination, this could potentially provide a totally non-stipulative solution to the problem of the Gapping/LPE difference. Given that V is commonly taken to head-move to *v* in English, LPE might simply admit of a non-elliptical derivation like the one Johnson posits for Gapping.

What kind of evidence might we find that LPE admits of a VP-coordination derivation? One line of evidence comes from the behavior of *again*. English *again* exhibits a characteristic ambiguity between two interpretations, referred to as the repetitive and restitutive readings. On the repetitive reading, *again* indicates that the action described in the predicate has occurred before, while on the restitutive reading it indicates merely that the end state of the action has previously obtained and the action has restored that state. On the repetitive reading, (104) presupposes that Susan has opened the window before. On the restitutive reading, however, (104) merely presupposes that the window had previously been open; Susan's opening it then restores it to its prior state.

(104) Susan opened the window again.

Johnson (2004) and Merchant (2013) argue first that the restitutive reading arises when *again* adjoins to VP and the repetitive when it adjoins to *v*P or VoiceP, and further that the lack of a restitutive reading when *again* flanks a verb phrase ellipsis, as in (105, from Johnson 2004), indicates that the ellipsis in question is too large to exclude restitutive *again*.

(105) The wind blew the door open and no one closed it. Finally, *Maribel did again.

In LPE, the restitutive reading is likewise out when *again* occurs in the right conjunct (106). On the face of it, this appears to be evidence that some relatively large constituent is going missing in LPE, at least as large as *vP*.¹⁷

(106) Susan loaded the van with the packages and the boxes in the truck again.

However, in LPE, unlike in VPE, the same result obtains when *again* is in the antecedent. In (107), if *again* is interpreted as modifying the right conjunct at all, it must be on the repetitive reading. This is surprising because an analogous VPE example permits the ambiguity easily (110). The reason restitutive *again* is impossible in (106) must therefore be different from the reason it is impossible in (105). In addition, when argument-structure mismatch does not occur, the restitutive reading is available (108, (108)). Note however that when *again* occurs in the LPE conjunct, it does not get interpreted in the left conjunct as well—(109) does not say anything about the van’s previous experiences with packages.

(107) Susan loaded the van again with the packages and the boxes in the truck.

(108) Susan loaded the van again with the packages and the truck with the boxes.

(109) Susan loaded the van with the packages and the truck with the boxes again.

(110) Susan closed her window again and John did too.

Thus the picture of why restitutive *again* is illicit in argument-structure mismatched LPE is rather complex. When argument-structure mismatch occurs, whether *again* occurs in the LPE conjunct or in its antecedent, if it is to be interpreted in the LPE conjunct at all it must take the repetitive reading. When argument-structure mismatch does not occur, *again* displays its normal ambiguity. This pattern can be accounted for relatively simply, if LPE examples are ambiguous with regard to the size of their coordination when no argument structure mismatch occurs but unambiguous when argument-structure mismatch applies.

When no argument structure mismatch occurs, either *vP* or VP coordination is possible, and ambiguity of *again* is possible regardless of which conjunct it surfaces in. When it occurs in the left, antecedent conjunct, it can be interpreted as either repetitive or restitutive and simply be adjoined to the coordinate VP or *vP*, scoping into both conjuncts. If instead it occurs in the LPE conjunct, its interpretation will determine the

¹⁷The following argument owes much to Johnson (2004)’s observation that VPE disallows the restitutive reading when *again* is pronounced in the elided conjunct.

possible size(s) of the coordination, since on the repetitive reading the very small, VP-coordination structure will not be able to contain it.

When argument-structure mismatch does occur however, the situation is different. Because, by hypothesis, argument-structure mismatch requires coordination of at least *vP*, in order to contain a distinct instance of the argument-structure-determining head *v*, a restitutive *again* adjoined below this position in the left conjunct will be unable to scope into the right conjunct. When the left conjunct's *again* is repetitive, it can be adjoined to the coordinated *vP* and thereby scope into both conjuncts unproblematically.

Likewise, if argument-structure mismatched LPE involves VP deletion, a restitutive *again* interpretation will be impossible when *again* surfaces in the right conjunct, because in order to escape the deletion it must be higher than VP.

What remains is to exclude the derivation in which *again* adjoins to VP in the left conjunct and is deleted under identity by the VP deletion in the right conjunct. But if argument-structure mismatch requires *vP* coordination, this too is unsurprising. In order for the verb to go missing, ellipsis must apply before V moves to *v*, or else V would be stranded outside the ellipsis site. That is, it must apply approximately as soon as *v* is Merged. If, however, Ochi (1999)'s account of the absence of *do*-support with low adjuncts in English is correct, *again* must instead be (Late) Merged counter-cyclically, after PF-merger of Infl and V, then it will not be present at the stage at which ellipsis applies. Since *again* does not trigger *do*-support (111), it is predicted to be absent from this very small ellipsis provided Ochi's account is on the right track.

- (111) a. John left early again.
 b. ? John again left early.
 c. * John did again leave early.

2.5.3. Interaction with derivational morphology in German

German, like English, possesses a class of *spray/load*-type alternating verbs.¹⁸¹⁹

- (112) a. Der Junge füllt das Glass mit Wasser.
 the boy fills the glass with water
 The boy fills the glass with water.

¹⁸Note that although the English equivalent of *füllen*, "fill", is not an alternator, the German word itself is.

¹⁹Thanks to Peter Baumann for the judgments in this section.

- b. Der Junge füllt Wasser in das Glass.
 the boy fills water in the glass.
 The boy fills water in the glass.

Moreover, German also possesses elliptical constructions analogous to English LPE (113) and Gapping (114), which are compatible with alternating verbs of this class.

- (113) a. Der Junge füllt das Glas mit Wasser und die Tasse mit Kaffee.
 the boy fills the glass with water and the cup with coffee
 The boy fills the glass with water and the cup with coffee.
- b. Der Junge füllt Wasser in das Glass und Kaffee in die Tasse.
 the boy fills water in the glass and coffee in the cup.
 The boy fills water in the glass and coffee in the cup.
- (114) a. Der Junge füllt das Glass mit Wasser und der Mann mit Kaffee.
 the boy fills the glass with water and the man with coffee
 The boy fills the glass with water and the man with coffee.
- b. Der Junge füllt Wasser in das Glass und der Mann in die Tasse.
 the boy fills water in the glass and the man in the cup
 The boy fills water in the glass and the man in the cup.

As for argument-structure mismatch in Gapping and LPE, German shows qualitatively the same pattern as English, though because of German's more extensive case-marking, actual ambiguities between LPE and Gapping like those seen in English are less pervasive, and the examples provided reflect this by differing in the string between the LPE and Gapping example.

- (115) a. *LPE*: Der Junge füllt das Glas mit Wasser und Kaffee in die Tasse.
 the boy fills the glass with water and coffee in the cup
 The boy fills the glass with water and coffee in the cup.
- b. *GAP*: ??Der Junge füllt das Glas mit Wasser und der Mann in die Tasse.
 the boy fills the glass with water and the man in the cup
 The boy fills the glass with water and the man in the cup.
- (116) a. *LPE*: Die Frau packte den Koffer mit Kleidern und Spielsachen in die Tasche.
 the woman packed the suitcase with clothes and toys into the bag
 The woman packed the suitcase with clothes and toys into the bag.
- b. *GAP*: ??Die Frau packte den Koffer mit Kleidern und der Mann in die Tasche.
 the woman packed the suitcase with clothes and the man into the bag

The woman packed the suitcase with clothes and the man into the bag.

However, for a subset of German *spray/load*-type alternating verbs, the pattern is different. In particular, while English *spray/load*-type alternating verbs are overtly identical in their *with*-frame and their *in*-frame, most German verbs mark this argument structure alternation with a derivational prefix *be-*, such that the verb cannot occur in the *with*-frame without it.

- (117) a. Der Mann lädt Kisten in den Wagen.
 the man loads boxes in the car
 The man loads boxes in the car.
- b. Der Mann belädt den Wagen mit Kisten.
 the man be-loads the car with boxes
 The man loads the car with boxes.
- c. *Der Mann lädt den Wagen mit Kisten.
 the man loads the car with boxes
 The man loads the car with boxes.

For verbs of this kind, argument structure mismatch in LPE is just as degraded as in Gapping.

- (118) a. *LPE*: *Der Junge belädt den Wagen mit Paketen und den Hund in das Auto.
 the boy be-loads the car with boxes and the dog in the car
 The boy loads the car with boxes and the dog in the car.
- b. *GAP*: *Der Junge belädt den Wagen mit Paketen und der Mann in das Auto.
 the boy be-loads the car with boxes and the man in the car
 The boy loads the car with boxes and the man in the car.

Moreover, even for verbs where *be-* is not obligatory in the *with*-frame, its presence in the antecedent renders argument-structure mismatch in LPE unacceptable.

- (119) a. *LPE*: *Der Junge befüllt das Glas mit Wasser und Kaffee in die Tasse.
 the boy fills the glass with water and coffee in the cup
 The boy fills the glass with water and coffee in the cup.
- b. *GAP*: *Der Junge befüllt das Glas mit Wasser und der Mann in die Tasse.
 the boy fills the glass with water and the man in the cup
 The boy fills the glass with water and the man in the cup.

This line of argument is consistent with some independent evidence about the size of the conjuncts in argument-structure mismatched LPE in German. In particular, the German adverb *wieder* ‘again’ is, like

its English equivalent, sometimes ambiguous between a repetitive and a restitutive reading. Not all German speakers perceive the ambiguity when *wieder* is in this position, but for those who do, the repetitive/restitutive ambiguity is preserved when argument structures match (120a), but only the repetitive reading is available when they mismatch (120b).

- (120) a. Der Junge füllt das Glas wieder mit Wasser und die Tasse mit Kaffee.
 the boy fills the glass again with water and the cup with coffee
 The boy fills the glass again with water and the cup with coffee.
- b. Der Junge füllt das Glas wieder mit Wasser und Kaffee in die Tasse.
 the boy fills the glass again with water and coffee into the cup
 The boy fills the glass again with water and the cup with coffee.

That is, when *wieder* is not overtly present in the second conjunct but interpreted there, it must be in a position too high to yield the restitutive reading. This is consistent with the hypothesis that argument-structure mismatched LPE involves extremely low coordination.

When *wieder* is pronounced in the second conjunct, as in (121) the situation is similar. As in English (109), when *wieder* surfaces in the right, LPE conjunct, it is not interpreted as applying to the left conjunct as well. In this case the repetitive reading is, again like in English, unambiguously available for the right conjunct; the restitutive reading is dubious here. Thus the structure of German LPE appears to be largely similar to that of English.

- (121) Der Junge füllt das Glas mit Wasser und Kaffee wieder in die Tasse.
 the boy fills the glass with water and coffee again into the cup
 The boy fills the glass with water and the cup again with coffee.

A significant difference between German and English in this regard is that the *in*- and *with* frames behave asymmetrically with respect to argument-structure mismatch in LPE in German. While the *with*-frame in the antecedent can acceptably antecede the *in*-frame in the LPE conjunct (115a), the reverse configuration is unacceptable (122a).

- (122) a. *LPE*: *Der Junge lädt den Hund in das Auto und den Wagen mit Paketen.
 the boy loads the dog in the car and the car with packages
 The boy loads the dog in the car and the car with packages.
- b. *GAP*: *Der Junge lädt den Hund in das Auto und der Mann mit Paketen.
 the boy loads the dog in the car and the man with packages

The boy loads the dog in the car and the man with packages.

One possible reason for this asymmetry is as follows. The *with* frame is the morphologically marked alternative in the *spray/load* alternation paradigm in German. It is therefore plausible that the *with*-frame differs from the *in*-frame in one of two ways: either it is more syntactically complex, containing an additional projection to host *be*-, or it requires to enter into a feature checking relation with the verb and the equivalent head in the *in*-frame does not.

In either case, the asymmetry between the *with* and *in* frames is then understandable if LPE involves extremely low coordination. All that is required is to assume that, in the absence of either the extra head hosting *be*- or a *with*-frame feature on the argument-structure-controlling head, the *with*-frame is impossible. Whenever the *be*- head is present, it will induce the *with*-frame in its complement verb phrase. When that complement consists of two coordinated clauses, as long as the *be*- head is satisfied after finding one verb phrase to mark with the *with*-frame (similar to the phenomenon of ‘closest conjunct agreement’), it will be able to induce the *with* frame either to the entire conjoined verb phrase or to its closest conjunct only. In this case the right conjunct will be able to take the unmarked *in*-frame argument structure. If there is no independent *be*- head in the right conjunct because the coordination is very low, the *with* frame will never be able to occur in the right conjunct without also occurring in the left conjunct.

2.6. Gapping-in-Gapping

One of the best-attested constraints on Gapping is what has been termed the *no-embedding constraint*: Gapping cannot apply in an embedded clause, where other elliptical constructions, such as VPE, can.

- (123) a. John drinks tea, and Mary coffee.
 b. * John drinks tea, and I think that Mary coffee.
 c. *cf.* John drinks tea, and I think that Mary does too.

This constraint has been built into a number of theories of the construction, by positing a mechanism in the derivation of Gapping that is crucially incompatible with its applying in an embedded clause. Further discussion of this point follows in the next section. It does not appear to have been noticed before that Gapping in a embedded clause can be improved significantly under a restricted set of circumstances. In

particular, embedded-clause Gapping is significantly less degraded provided Gapping has applied in the matrix clause as well (hereafter *Gapping-in-Gapping* or *GiG*).²⁰

Because of the complexity of the examples, some context may be necessary for them to sound fully acceptable. For instance, if our friends John and Mary have recently broken up, and we have come to the conclusion that we have a difference of opinion *why* they have broken up, but have had difficulty determining what our difference of opinion is, I might say, upon coming to a conclusion about what our difference of opinion is, something like (124a).

- (124) a. ? I think that John resents Mary, and you, Mary John.
 b. * I think that John resents Mary, and you think that Mary, John.

Similarly, if one has just returned from an interdisciplinary humanities seminar on the topic of *Universal Love*, one could, when asked how the seminar went, reply with (125a).

- (125) a. ? The therapists proposed that everyone loves someone, and the theologians, Someone everyone.
 b. * The therapists proposed that everyone loves someone, and the theologians proposed that Someone, everyone.

And if our friends John and Mary have a rather serious political disagreement, one might characterize their difference of opinion with something like (126a).

- (126) a. ? John believes that government should regulate business, and Mary, business government.
 b. * John believes that government should regulate business, and Mary believes that business, government.

All of these examples are somewhat bizarre, but importantly, they are significantly better than the relevant (b) examples which are like them in all respects except for the absence of a Gapping configuration in the matrix clause. Some of the residual weirdness of the (a) examples appears to be because of prosody-dependence: focus intonation is required on all three remnants, and three-remnant Gapping is independently somewhat awkward.

²⁰The judgments here and throughout are not shared by all speakers of English, but all individuals whom I have asked about these examples who do detect a contrast (approximately 15) have it in the direction reported. Moreover, the acceptability contrasts reported are *relative* judgments, and relative in particular to the strong unacceptability of Gapping in an embedded clause under normal circumstances. Impressionistically, speakers of English who detect a contrast between GiG and straightforward embedded Gapping tend to be younger, suggesting a possible case of language change in progress.

- (127) a. I spoke to John today, and you yesterday.
 b. I spoke to John today, and you to Mary.
 c. ? I spoke to John today, and you to Mary yesterday.

When prosody is controlled for, however, judgments appear to be fairly stable. All of the native speakers I have consulted judge the (a) examples in (2-4) better than the (b)s, though they differ on the absolute acceptability levels of both classes of examples.

Note however that in all of the examples of *GiG* provided so far, the two remnants of the lower clause are the same NPs as those in the lower correlate clause, but in reverse order. This is not an essential property of the construction: (128), while noticeably harder to understand than (124a), (125a), or (126a), is pretty good in an appropriate context. For instance, if John and Peter collaboratively made a decision to select a single individual to accompany one of them in some task (as on a game show with mutable teams), and it was unclear both which of them was most responsible for the act of choosing and whom they chose, (128) seems a sensible way of expressing a difference of opinion about what transpired.

- (128) ?? I think that John chose Mary, and you, Peter Debra.

The difference in acceptability between examples like (128) on the one hand and those like (124a) on the other can plausibly be attributed to the greater difficulty of establishing brand new focus alternative sets (in roughly the sense of Rooth (1992)) than retrieving them from the correlate clause.

Another reason for ascribing the imperfect status of *GiG* examples (relative to simple Gapping) to performance issues is that a minority of speakers²¹ are more than usually tolerant of the construction and allow it to apply again, several clauses deep.

Although it quickly becomes very difficult to understand, these informants can be ‘talked up’ to accepting triply or quadruply embedded examples like (130a) and (131a). This is reminiscent of the behavior of multiply center embedded sentences, in that each level of embedding is more confusing than the last, but there appears to be a sharp discontinuity between one and more than one embedding.

- (129) a. The therapists proposed that everyone loves someone, and the theologians, Someone everyone.

²¹I have found four speakers who clearly fit this category and a handful of others who are marginal.

- b. * The therapists proposed that everyone loves someone, and the theologians proposed that Someone everyone.
- (130) a. John said that the therapists proposed that everyone loves someone, and Mary, the theologians, Someone everyone.
- b. * John said that the therapists proposed that everyone loves someone, and Mary said that the theologians, Someone everyone.
- (131) a. I heard that John said that the therapists proposed that everyone loves someone, and you, Mary, the theologians, Someone everyone.
- b. * I heard that John said that the therapists proposed that everyone loves someone, and you heard that Mary, the theologians, Someone everyone.

I assume hereafter that these examples are not ungrammatical but are merely difficult to understand because of the very large number of focus alternatives that must be considered to interpret them. In the remainder of this article, I concentrate on ‘simple’ cases of *GiG* with only one level of embedding, since the judgments for examples like (130a-131a) are rare and murky enough to warrant postponing for the time being. In the next section, I discuss some problems that the acceptability of *GiG* examples relative to unameliorated embedded-clause Gapping poses for a celebrated class of analyses that derive Gapping via Across-the-Board (ATB) movement, and subsequently provide an alternative analysis of the construction and a hypothesis as to the source of its improvement over straightforwardly ungrammatical cases of embedded-clause Gapping.

2.6.1. Incremental summary

The *no-embedding constraint* is one of the best-attested idiosyncratic properties of Gapping. The construction I am calling *GiG* appears to be a significant exception to this generalization. The basic pattern for *GiG* is the following. Gapping is ameliorated in an embedded clause provided there is a Gapping construction in the matrix clause as well (132). When Gapping applies only to the lower clause, the result is strongly degraded (132a); it must apply either to both (132b) or to only the upper clause (132c).

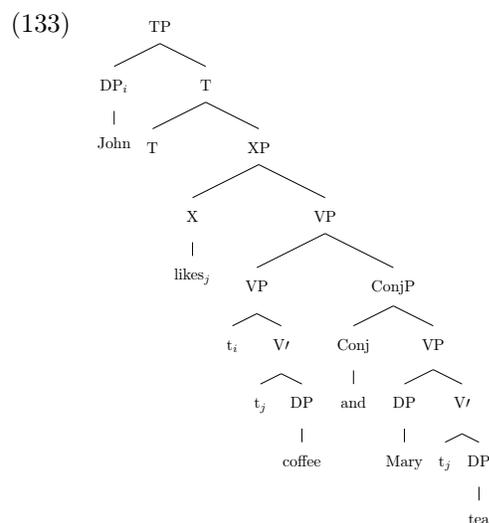
- (132) a. * I think that John resents Mary, and you think (that) Mary John.
- b. ? I think that John resents Mary, and you, (that) Mary John.

- c. I think that John resents Mary, and you *(that) Mary resents John.²²

Although Gapping cannot normally occur in an embedded clause, when the matrix clause is Gapped as well, with one of its remnants the embedded clause in which further Gapping applies, the result (i.e. *GiG*) is significantly more acceptable. The behavior of *GiG* across multiple clauses, and its improvement when the remnants are identical to the correlates in reverse order, suggest that the residual weirdness of examples like (124a) is a performance issue. Descriptively, it appears that **Gapping creates an environment conducive to further Gapping**: one where the usual constraints on Gapping are relaxed.

2.6.2. Small-conjunct Across-the-Board movement (ATB) analyses

In analyses following Johnson (1994), Gapping is derived not by deletion of material in the Gapped clause under some condition of identity with material in the antecedent clause, but by ATB movement. The categories coordinated in a Gapping construction are approximately VP-sized (VP, *vP*, PredP...). The subject of the left conjunct has undergone movement into the shared Spec,TP, while the right conjunct subject remains *in situ*. Material that is ‘missing’ from the right conjunct (viz. the verb) has not been elided but rather moved out across-the-board. In the versions of Johnson’s hypothesis considered here, this is by head-movement.²³ This is schematized in the tree in (133).



²²The somewhat complex pattern of complementizer omission in these examples is discussed below.

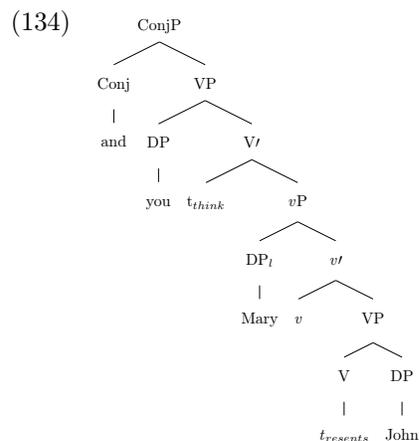
²³Other versions of this hypothesis, e.g. Johnson (2009), propose that this movement is remnant phrasal movement, but these approaches do not straightforwardly derive the no-embedding constraint, and are thus less relevant to the present discussion.

On these analyses, the no-embedding constraint on Gapping follows straightforwardly from the general head-movement constraint (Travis 1984, Baker 1988): Gapping is prohibited in embedded clauses because head-movement is constrained to step through all C-commanding heads, and this is (for one reason or another) impossible in general across finite clause-boundaries.

2.6.3. Problems for small-conjunct ATB analyses of Gapping

The relative acceptability of *GiG* is problematic in several ways for small conjunct, ATB analyses of Gapping.

2.6.3.1. A selection semi-problem. One way *GiG* is problematic not only for Johnson (1994)'s, but also any analysis that allows Gapping exclusively in small conjunct coordinations (e.g. Coppock 2001, Toosarvandani 2013), is that Gapping occurs in the embedded clause at all.²⁴ If Gapping only occurs in VPs/*v*Ps, one must posit that *think* can take a VP/*v*P complement in addition to a CP, an undesirable result since this does not appear to occur in other contexts.

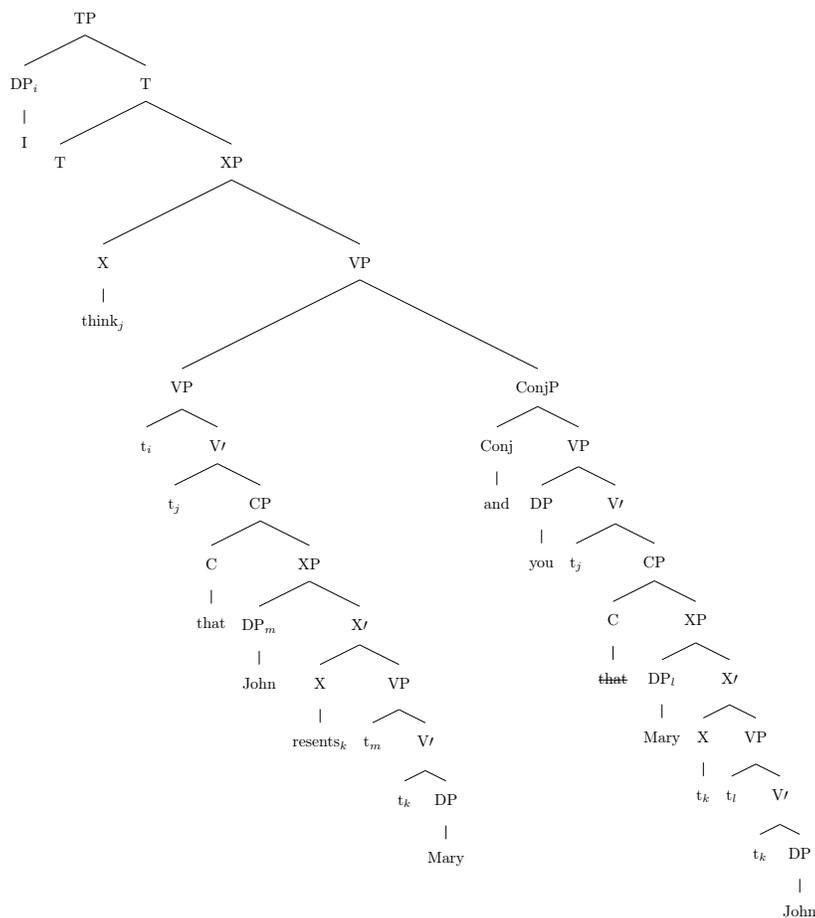


I do not have much more to say about this issue at this point other than to remark that the most obvious solution to it would require a considerable complication of the machinery involved; if there is, say, a Gapping-specific functional head (already an undesirable stipulation) with appropriate selectional requirements and lexical duplication of the relevant class of sentential-complement taking Vs (probably the class of bridge verbs) then a configuration like the one in (4.2) could in principle be licensed.

²⁴If this construction is really Gapping, and not something that looks superficially like Gapping but involves large conjuncts, the problems below apply. On the other hand, if this is really “not” Gapping but involves large conjuncts, this amounts to the claim that the expressions that we’ve been calling “Gapping” can involve large conjuncts, and much the same conclusions obtain.

2.6.3.2. A linearization problem. A more serious problem arises in connection with the hypothesis that the right conjunct in a Gapping construction is vacated by ATB movement. Assume the numeration of (124a) contains two instances each of *John* and *Mary*, and no verbs besides *think* and *resent* to license Case or theta-roles. In a system that takes very seriously *Merge over Move* (Chomsky, 1995), the principal that the syntax prefers to extend the structure under construction by introducing new lexical items from the numeration rather than moving an already-introduced lexical item when either operation would be licit in principle, (124a)/(135) may not be derivable at all. This is because at the point in the derivation that sideward movement of *resents* must occur, the numeration still contains *think*. But if *think* simply lacks the necessary theta-role to license a nominal object, this problem may be avoidable. If so, sideward movement of both verbs from the right to the left conjunct may be licensed under Last Resort (Hornstein & Nunes 2002).

(135)

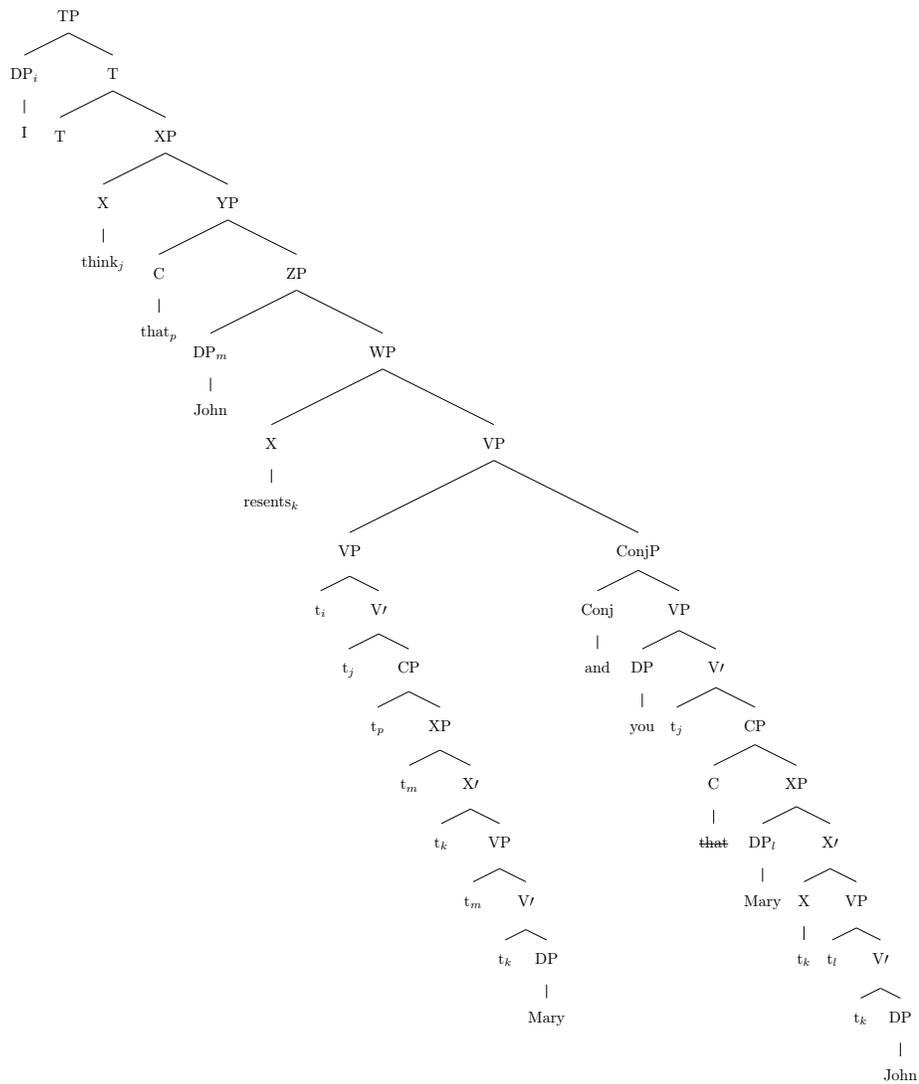


In any case, the resulting structure has other problems. Linearization of movement chains is standardly understood to require a C-command relationship to be established between the copies of a moved constituent, which can be satisfied either because the constituent's landing site C-commands its base position (Kayne, 1994) or because the final landing site of a sideward-moved constituent C-commands all its other positions (Nunes, 1995, 2001). Assuming that a unique position C-commanding all of a moved constituent's other positions is required, regardless of whether the movement is strictly upward or contains sideward steps, (135) will be unlinearizable. This is because no C-command relationship cannot be established between the copies of *resents*: from the left conjunct it does not C-command into the right, and word order facts argue against its having moved over the coordination from which position it could C-command the lower copy in each conjunct. If *resents* has raised over the coordinated structure, it should C-command the upper clause as well and thereby precede it, yielding a linear order like (136).

(136) * Resents I think that John Mary, and you, Mary John.

Deriving the correct order would require an otherwise unmotivated series of evacuatory movements: all the contents of the left conjunct above *resents* must move out of it, over *resents*, in order to derive the correct word order (4.3).

(137)



This movement will not be ATB, and thus must be A-movement (on the assumption that at least head-movement and A'-movement are subject to the CSC), but it is not clear that there is a relevant A-position for *John* below the matrix verb, and A-movement of a complementizer is unexpected in general. The lower clause's verb appears to be problematic for ATB analyses of Gapping quite generally: provided they depend upon movement *out of* the coordinate structure in order to license interarboresal movement, they will be unable to naturalistically handle the conflict between linearization and word order facts in the lower clause.

2.6.4. Analysis

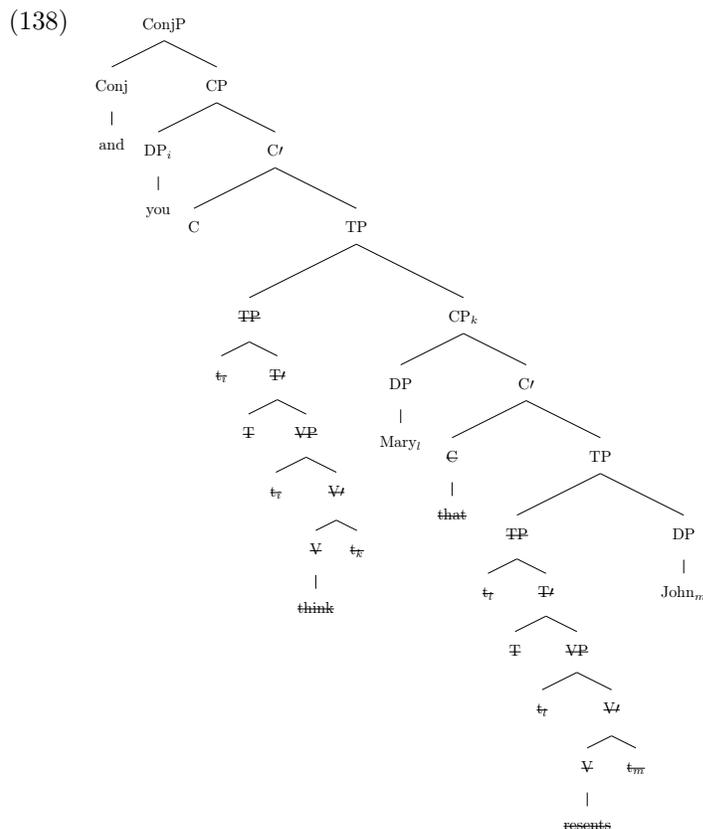
The restriction on *GiG*—that it is parasitically dependent upon Gapping in the matrix clause—provides an important clue to the nature of the general *no-embedding constraint* on Gapping. The ingredients to an analysis of this dependency are a robust implementation of the segment/category distinction such as Hornstein (2009)’s *decomposed Merge*, plus the hypothesis that the right Gapping remnant must move to an adjoined position, possibly because they move rightward (Jayaseelan 1990).²⁵

2.6.4.1. Proposal. In response to the problems with small-conjunct ATB analyses discussed above, I assume that Gapping strings can be derived from clause-sized structures (*large-conjunct Gapping*, cf. Sag (1976), Hankamer (1973), Jayaseelan (1990), Wilder (1994), etc.), and crucially, that the Gapped constituent is vacated via ellipsis rather than movement.

A large-conjunct analysis can handle *GiG* better. Though it does not straightforwardly predict the construction’s parasitism, it is at least possible to assign a well-formed structure to the examples (138).²⁶

²⁵It is not straightforward how to diagnose leftward vs. rightward movement out of an unpronounced constituent, of course, but for at least many speakers of English, P-stranding is degraded in Gapping as it is in rightward movement generally. However, those speakers who allow P-stranding in Gapping do not appear to systematically differ from those who do not in their ability to accept *GiG* examples, and moreover do not allow P-stranding in rightward movement in general. Possibly the violation incurred by rightward movement out of PP can be remedied by ellipsis for these speakers and not for others, an issue which bears further investigation.

²⁶I assume for the moment that *that*-deletion is a separate issue from the main ellipses here, and revise this assumption below.



In this structure, two instances of right-adjunction have applied, followed by two applications of TP-ellipsis. The whole embedded CP right-adjoins string-vacuously to the upper TP in the right conjunct. Subsequently the DP *John* right-adjoins (again string-vacuously) to its TP. The TPs are then elided under identity with the antecedent TPs. This account, unlike a small-conjunct ATB analysis, can license the structure and handle the word order facts. The principal puzzle, however—the dependency of embedded-clause Gapping on Gapping in a matrix clause—is not yet explained.

GiG's parasitism on matrix Gapping can be accounted for by combining the hypothesis that right Gapping remnants move right with Hornstein (2009)'s *Decomposed Merge* analysis of adjunction. The Decomposed Merge hypothesis runs as follows. Merge consists of a series of two more primitive operations, Concatenate and Label. Concatenate simply forms a complex object out of its two inputs. Labeling allows the labeled concatenate to be an atomic input to further Concatenate operations, yielding hierarchical structure-building. Combination of linguistic objects always involves Concatenate, but Label is sometimes optional: in particular

for adjuncts. The difference between concatenation and concatenation plus labeling is thus similar to the domination/containment distinction familiar from GB.

If the right Gapping remnant must move right, it must end up in an adjoined position. So in (124a)/(138), the upper copy of the clausal right remnant *Mary John* may be concatenated to the larger structure unlabeled. It will thus not be dominated by any higher CP (or anything else for that matter).²⁷ I hypothesize that Gapping is available in an embedded clause precisely when that clause has been dislocated and adjoined, since its higher, adjoined copy is undominated.

This suggests a possible explanation for the no-embedding constraint: it reflects a special focus condition on Gapping remnants that they occupy a focus position in a clause at at least the matrix level relative to the structural height of the correlate clause in order to take discourse scope. Of course, then the further question is, why must the focalized elements in Gapping have discourse scope?

I do not have an answer to this question except to remark that Gapping remnants have to be contrastive (Kuno 1976 etc.) and bear contrast prosody in general (139-140), and that this requirement seems intuitively more stringent than analogous constraints on other elliptical constructions (b examples), and more stringent than the pragmatic constraints on unelided equivalents (c examples).

- (139) a. *John likes beans, and Mary, beans.
 b. John likes beans, but I'm not sure why beans.
 c. ?#John likes beans, and Mary likes beans.
- (140) a. *John likes beans, and John, rice.
 b. John likes beans, or at least I think John does.
 c. #John likes beans, and John likes rice.

2.6.4.2. Predictions. This analysis makes a number of predictions about related Gapping constructions. First, assume that the right-hand remnant of a Gapping construction must move right in English, and thus be concatenated without labeling, while the left-hand remnant must occupy a Spec position, because unlabeled material cannot be linearized flanked by labeled material on either side. Then it is predicted that when the

²⁷Thus what I've written as Chomsky-adjunction in the tree in (138) should really use Hornstein's (very difficult to typeset) concatenation notation with $\hat{\ }.$

clausal remnant of the matrix Gapping is the left rather than right remnant, *GiG* is less acceptable than equivalent examples with the clausal remnant on the right, as in (141).²⁸

- (141) a. * That John married Susan surprised me, and (that) Susan John, you.
 b. It surprised me that John married Susan, and you, that Susan John.

More interesting are the predictions for a related class of Gapping constructions where the right hand remnant originates in a lower clause, the rest of which is deleted (*long-distance Gapping*, 142; see e.g. Steedman 1990, Lechner 2001, Grano 2015 for more discussion of this construction, with widely varying reports of its acceptability).

- (142) Harry claimed that hedgehogs eat mushrooms, and Barry, frogs. (Steedman 1990)

If the Right Roof Constraint is not ameliorated by PF-deletion (Lasnik 2013), the right remnant cannot have moved into the upper clause in order to escape this deletion. Instead, examples like (142) may have a structure like the one we proposed in (138) above, with two separate deletions, the lower of which is asymmetrically dependent upon the upper—examples of *GiG* where the lower Gapping leaves only a single remnant. This predicts that long-distance Gapping should be degraded when the right remnant is followed by material originating in the matrix clause of the right conjunct, a prediction which appears to be borne out (143).

- (143) a. Harry said to the committee that hedgehogs eat mushrooms, and Barry, frogs.
 b. * Harry said to the committee that hedgehogs eat mushrooms, and Barry, frogs, to the director.

This may at first appear to be attributable to the general dispreference, in Gapping constructions, for three Gapping remnants, but not that when an additional PP appears in the Gapped conjunct but associated with the embedded clause (144a), the example is, while still awkward, still detectably less degraded than when it originates in the upper clause. This pattern is consistent with the predictions of the hypothesis

²⁸Note that this is not equivalent to claiming that all leftward movement must be by substitution rather than adjunction, because the substitution/adjunction distinction does not precisely align with the labeled/unlabeled distinction: in particular, movement to non-peripheral positions must be labeled in order to be linearized; but this applies equally whatever the motivation for the movement may be. Whether movement is induced by feature-checking or EPP-satisfaction or whether it is stylistic or free, or indeed whatever it is caused by, in a Concatenate+Label system it will only be able to surface flanked by Labeled material on either side if it is Labeled itself.

whereby LDG is a species of GiG and GiG requires the lower clause to be in an un-Labeled adjunct position, in which it cannot be flanked by matrix clause material on each side.

- (144) a. ?Harry said to the committee that hedgehogs eat mushrooms for their vitamin content, and Barry, frogs for their protein.
 b. *Harry said to the committee that hedgehogs eat mushrooms, and Barry, frogs, to the director.

2.6.5. What's up with *that*?

When a Gapped clause and its antecedent are co-embedded, inclusion of a complementizer in the Gapped clause causes degradation for some speakers (Fiengo (1974)). Most other kinds of ellipsis are not subject to this constraint.

- (145) a. I suspect that John likes coffee and %(that) Mary, tea.
 b. I suspect that John likes coffee and (that) Mary doesn't.

In *GiG*, a complementizer may optionally be present before the lower Gapped clause, with no strong contrast in acceptability for most speakers.²⁹ This is somewhat surprising on the hypothesis that *GiG* is fundamentally like other instances of Gapping.

- (146) a. I think that John resents Mary, and you, Mary John.
 b. I think that John resents Mary, and you, that Mary John.

More strikingly different from *GiG*, however, is the behavior of single Gapping constructions with clausal remnants where only the upper clause has been Gapped. Here the presence of the complementizer is obligatory, as noted in e.g. Bošković & Lasnik (2003).

- (147) a. *I think that John resents Mary, and you, Mary resents John.
 b. I think that John resents Mary, and you, that Mary resents John.

Omission of the complementizer before the clausal remnant results in very strong unacceptability, whether there is a complementizer in the correlate clause or not. This is consistent with the general requirement that dislocated clauses must have overt complementizers, on the hypothesis that Gapping remnants have moved.

²⁹There does appear to be some inter-speaker variability on this point, which bears further investigation.

(148) Left-dislocation

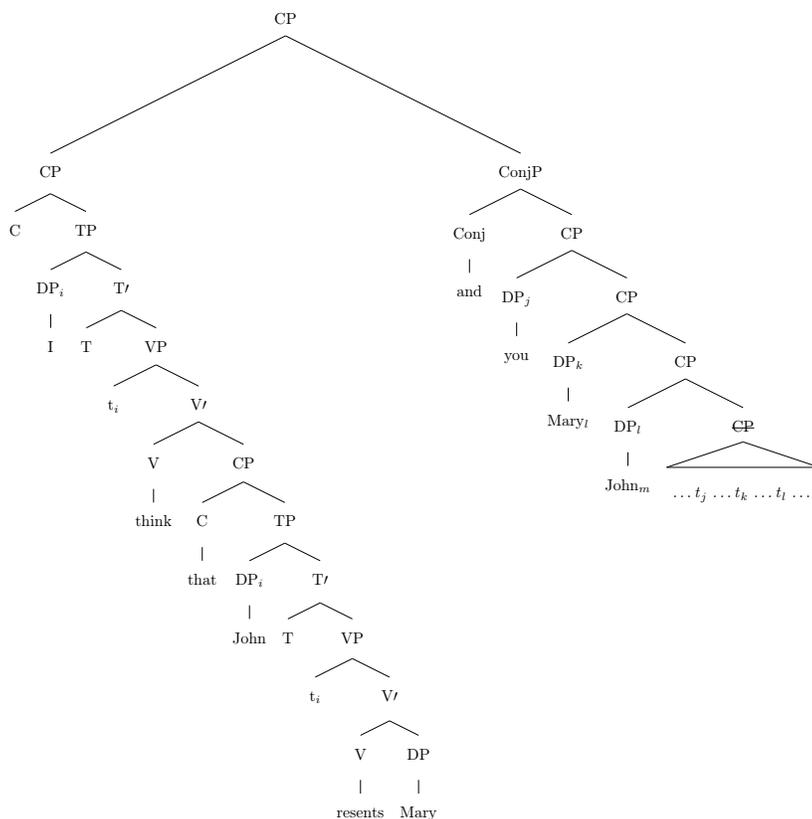
- a. That the Riemann hypothesis is true, I doubt anyone can prove.
 b. *The Riemann hypothesis is true, I doubt anyone can prove.

(149) Right-dislocation

- a. I doubt anyone can prove, without the assistance of a humanlike AI, that the Riemann hypothesis is true.
 b. *I doubt anyone can prove, without the assistance of a humanlike AI, the Riemann hypothesis is true.

Because of this, Marcel den Dikken (*p.c.*) proposes an alternative analysis of *GiG* via amelioration of multiple long scrambling (not normally available in English) by PF-deletion. Under this analysis, examples like (124a) would have a structure like (150). All the remnants have scrambled into multiple specifiers of the matrix CP in the remnant clause (*tucking in* as in Richards 1997b).

(150)



A major motivation for this analysis is that Dutch *GiG* examples obligatorily omit the complementizer before the latter two remnants (151), while complementizer omission is unavailable elsewhere in Dutch (152).³⁰ If the two rightmost *GiG* remnants form a clause that is intact apart from the Gapping itself, this is unexpected.

(151) Ik denk dat Jan Piet haat, en jij, (*dat) Piet Jan.
I think that John Pete hates, and you, that Pete John.

(152) Ik denk *(dat) Jan Piet haat.
I think that John Pete hates.

The Dutch argument does not quite go through, however. In more normal cases of embedded Gapping in Dutch, when the antecedent clause and the Gapped clause are co-embedded as in (145a), the complementizer is unavailable. If Gapping is incompatible with complementizers more generally in Dutch than in English, its unavailability in this context is less surprising.

(153) Piet denkt dat John Japans kan spreken en *(dat) Maria Maleis.
Pete thinks that John Japanese can speak and that Mary Malay
Pete thinks that John can speak Japanese and Maria, Malay.

Moreover, there is independent reason to suspect that long-scrambling is an unlikely source for this construction in English. The reason for this is that some *GiG* remnants (154) are reasonably acceptable which are of categories that are unable to undergo scrambling in Germanic (Grewendorf 1990).

- (154) a. **AP argument:** I thought the dwarves acted docile, and you, the elves, hostile.
b. **Directional PP:** I thought the girls walked into the woods, and you, the boys, into the field.

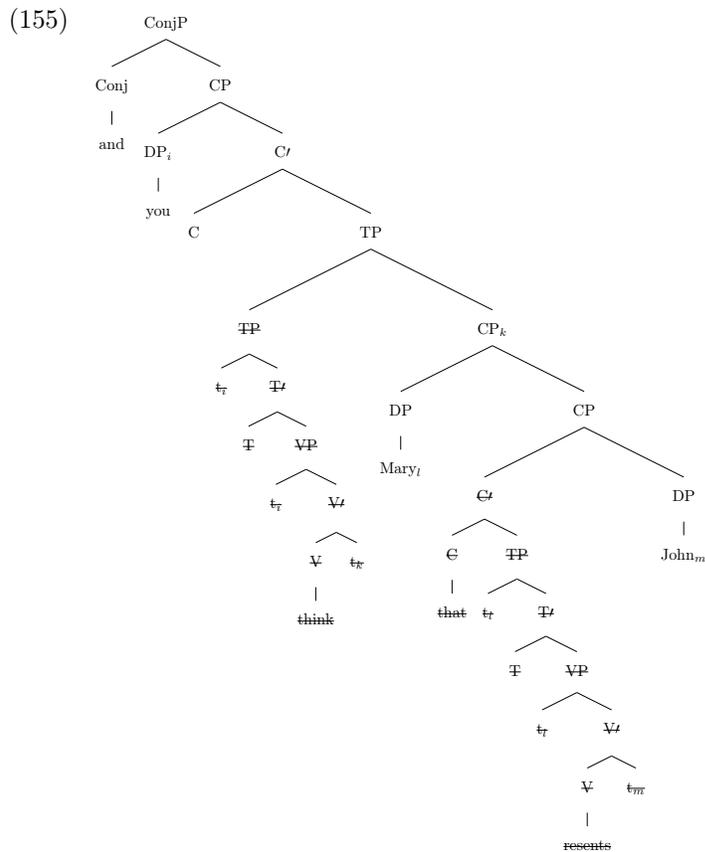
Moreover, an analysis that treats *GiG* as resulting from two instances of Gapping, rather than a single multi-clausal deletion operation, makes correct predictions about the availability of pseudo-Gapping in *GiG* contexts, unaccounted for on the long-scrambling hypothesis.

Why, then, is the COMP in *GiG* apparently optional in English? I propose that the answer to this question is simply that the combination of suitable input configuration and deletion operation that yields Gapping can in principle obtain over constituents of multiple sizes (see Potter et al. 2013 for extended discussion of other evidence leading to this conclusion).

³⁰Thanks to Marcel Den Dikken (*p.c.*) for the Dutch judgments in this section.

I hypothesize that the non-null complementizer is *always* obligatorily present in *GiG*, just as in other dislocated clauses, but its presence can be obscured in a restricted range of circumstances: namely, when the lower left remnant has moved to a position in the C-domain that is structurally higher than the position of COMP.³¹ This, then, calls for a revision to the hypothesized tree in (138).

When COMP is absent in the lower Gapped clause, the lower left remnant has moved above it into the C domain, and either the doubly-filled COMP filter forces COMP deletion, approximately as in (138), or some category including the COMP is deleted, as schematized in (155).



When COMP is present in the lower Gapped clause, the lower left remnant is somewhere under it, and a smaller category is deleted.

³¹Compare the account of filled-COMP effects in (Baltin, 2010).

2.7. Conclusion

This chapter has made the case that Gapping is ambiguous between coordination of large, clause-size conjuncts and small, verb phrase-sized conjuncts, and that both forms of Gapping in English involve deletion of syntactic material. After reviewing the arguments in Potter et al. to this effect, several additional arguments were adduced supporting the same conclusion, principally hinging on the distinct properties of Gapping as compared to superficially similar constructions like Left-Peripheral Ellipsis and subGapping. Along the way, this chapter has supported the general thesis that feature-mismatch between an elided constituent and its antecedent is tolerated so long as the ellipsis excludes the functional head bearing the relevant feature, but also suggested that similar cases of mismatch are possible when both the elided constituent and its antecedent are coordinated under the feature-bearing functional head.

CHAPTER 3

Be/have effects

This chapter discusses the interaction of agreement exponence and conjunct size in Gapping constructions in English and Hebrew. Both languages permit Gapping constructions of variable conjunct sizes, and both languages are in general insensitive to the identity or non-identity of the agreement exponence of the Gapped verb and its antecedent. Unlike in Verb-Phrase Ellipsis, where English uniformly requires agreement matching for the verbs *be* and auxiliary *have*, in Gapping this language requires these verbs to match in agreement exponence only in a restricted range of circumstances, which prior research (Potter et al., under revisions) identifies as configurationally convex: all and only those ‘Gapping’ constructions involving coordinated CPs (‘large-conjunct Gapping’). Quite in contrast, Hebrew requires matching of all verbs in general for the ϕ -feature of Person only in Gapping constructions that appear to be derived via Verb Phrase coordination (‘small-conjunct Gapping’) and not in apparent large-conjunct Gapping at all. Both the English pattern on its own and the contrast between the English and Hebrew patterns are problematic for existing accounts of the so-called *be/have*-effect in English.

Ultimately, I propose that the complex pattern of differences between large- and small-conjunct Gapping’s sensitivity to agreement mismatch between English and Hebrew can be accounted for if ϕ -features are in principle subject to the antecedent-ellipsis identity requirement, but are only able to impact the acceptability of an ellipsis under the rare circumstance that either (i) the highest head bearing a copy of the ϕ -features is deleted or (ii) a single element has head-moved out of both the antecedent and Gapped conjunct and is unable to realize conflicting feature specifications. These hypotheses plus independently plausible language-particular differences in the precise size of the elided conjuncts in large- and small-conjunct Gapping, as well as the surface position of the verb, account for the difference between agreement mismatch in large- vs. small-conjunct Gapping across English and Hebrew, and make some (apparently correct) predictions about related ellipsis constructions, and about large- and small-conjunct Gapping in other languages.

3.1. *Be/Have* Effects in English Gapping

The identity relation between English Verb Phrase Ellipsis (VPE) and its antecedent is known to be in general insensitive to inflectional morphology.

(158) I have always liked ellipsis and soon you will ~~like ellipsis~~ too.

The exceptions to this generalization are *be* and auxiliary *have*, as noted in Warner (1985) and discussed in Lasnik (1995), Potsdam (1997), Roberts (1998), Omaki (2007), and elsewhere.

(159) *I am confused about ellipsis and you should ~~be confused about ellipsis~~ too.

Gapping, another elliptical or ellipsis-like construction, does not display this sensitivity: *be* and auxiliary *have* can, when Gapped, differ from their antecedent in the inflectional morphology they would display were they overt.

(160) I am a doctor and my husband is a lawyer.

This insensitivity to inflectional morphology, however, does not extend to all Gapping constructions in English. In particular, in Gapping constructions that involve topicalization in each conjunct (for the acceptability of which, see e.g. Lopez & Winkler 2003), *be* and auxiliary *have* behave as they do in VPE, degrading in the absence of morphological identity with their antecedent.¹

(161) a. Medicine, Susan is a doctor of, and philosophy, her husband.

b. *Medicine, I am a doctor of, and philosophy, my husband.

(162) a. At parties, Mary has been having trouble getting along, and at work, John.

b. *At parties, I have been having trouble getting along, and at work, John.

¹The examples given here use person mismatch for reasons of simplicity. For some speakers, there may be a slight difference between the degree of degradation induced by person mismatch and number mismatch, with the latter being somewhat less degraded; compare the examples in (1) below with (161b) and (162b) in the main text. I do not propose an explanation for this difference because I am uncertain of the reliability of the relevant contrasts, but if it does obtain, an explanation like the one sketched below for Hebrew might be extensible to these English facts as well.

(1) a. ??Medicine, Susan is a doctor of, and philosophy, her children.

b. ??At parties, Mary has been having trouble getting along, and at work, her children.

Note that this does not occur in Gapping constructions in which a single constituent has been topicalized Across-the-Board (ATB) from both the Gapped and un-Gapped conjunct. Such examples show the inflection-insensitivity more typical of Gapping generally.

- (163) a. Medicine, I am a doctor of and my husband a student of.
 b. At billiards, I am proficient and my husband passable.

Similarly, in ATB *wh*-moved Gapping constructions, *be* and auxiliary *have* need not take identical inflection in each conjunct, and instead show agreement with the closest conjunct.

- (164) a. Of what am I becoming a doctor and my husband a student?
 b. At what am I growing proficient and my husband passable?

This is similar to the pattern observed in subGapping in section (2.4.4). Note, however, that subGapping shares the scopal properties of small-conjunct Gapping, while it is the application of large-conjunct tests to Gapping examples that induces *be/have* effects. This suggests that (i) the origin of the *be/have* effect is different in this case and, more interestingly, (ii) the absence of *be* in the right conjuncts in small-conjunct Gapping examples is not due to the ATB movement that derives its absence in subGapping.

Below I discuss the implications of these observations for theories of Gapping according to Gapping examples are syntactically ambiguous. That is, on theories of this kind, the surface configuration of Gapping can reflect either clausal or verb-phrase coordination. By integrating this hypothesis with explanations from the literature for the exceptional behavior of *be* and auxiliary *have* (hereafter ‘*be/have*-effects’) in VPE, I offer a proposal in this vein to account for the morphology-sensitivity of Gapping with topicalization.

Potter et al. (under revisions) argue that Gapping derivations are available for coordinations of two different sizes. (Similar proposals are Repp 2006 and Carlson et al. 2005.) In particular, they argue that a systematic scope ambiguity present in Gapping (discussed in Siegel 1984, Oehrle 1987 and McCawley 1993), such that scope taking material high in the left conjunct can scope either over both conjuncts (wide scope) or individually within each conjunct (distributive scope), indicates that Gapping conjuncts can be of two different sizes. When they are large, approximately clause-sized, the overt scope taking material will be duplicated within the Gap in the right conjunct, yielding distributive scope. When they are small,

approximately VP-sized, the scope taking material will not be present in the right conjunct and will simply take both conjuncts in its scope.

Importantly, Potter et al. show that one or the other reading disappears when Gapping is combined with constructions that are predicted to be available in only one conjunct size or the other. For instance, topicalization in the Gapped clause (as in 4) is only possible with distributive scope because only here is the right conjunct large enough to contain a Topic phrase in the C domain, while ATB *wh*-movement out of both conjuncts (as in 5-6) is only compatible with wide scope, because only then are the conjuncts small enough to share a landing site for *wh*-movement. Given the observations in (3-5) above, this proposal implies that when Gapping is derived from coordination of clause-sized conjuncts, *be* and *have* behave as they do in VPE, requiring morphological identity with their antecedent. (For arguments as to the validity of these tests, see Potter et al. under revisions). This pattern presents an analytic problem: why do *be* and auxiliary *have* behave the same in hypothetically large conjunct Gapping (LCG) as in VPE, but not in hypothetically small conjunct Gapping (SCG), if the latter is configurationally more similar to VPE? After considering some apparently non-starter explanations, in the following sections I propose that the sensitivity of an elliptical construction to ϕ -features depends upon the relative position of the verb that hosts the ϕ -features and the node that licenses the ellipsis.

3.1.1. A Possible Explanation

Lasnik (1995) explains *be/have*-effects in VPE in the following way. He argues for a hybrid lexicalist position whereby verbs can be inserted in the derivation with or without their inflectional forms. Verbs inserted inflected must undergo head movement to check their inflectional features, while verbs inserted uninflected (in English) receive their inflection from the head Infl under PF adjacency. In English, all verbs other than *be* and auxiliary *have* are inserted bare. This difference explains both the different order of these elements with respect to adverbs and negation (since they must raise to check their inflectional features in the overt derivation) and their inability to antecede inflectionally distinct forms of themselves in VPE.

Lasnik's approach does not explain why *be* and auxiliary *have* should behave differently in different elliptical contexts. At least three extensions are possible. First, a possible analysis would be to claim

that ‘small’ conjunct Gapping is, in fact, not ellipsis, but is derived via Johnson (1996 et seq.)-style ATB-movement. All ‘genuine’ elliptical constructions, then, would be predicted to show *be/have*-effects. This conclusion is undesirable, however, because it entails that other well-studied elliptical constructions are not derived via deletion, complicating the overall apparatus of the theory. On the other hand, it might be the case that *be/have*-effects are determined not by the size of the elided category but by whether ellipsis applies before or after inflectional feature-checking, as in Omaki (2007)’s proposal. This possibility is unattractive because it is unconstrained and unmotivated: why should feature-checking have to be early, before ellipsis, for VPE and large-conjunct Gapping but late for small-conjunct Gapping (and other ellipses without *be/have* effects)?

Lastly, *be/have*-effects might arise when the head licensing ellipsis is relatively low in an extended projection across which ϕ -feature agreement occurs, such that the elided constituent is marked for ellipsis before ϕ -feature agreement with a higher projection is able to occur. Provided that failure of lexically-inflected elements to check their agreement features does not yield a derivational crash if these features are deleted, deletion of them before they can enter into an agreement relation with a higher head may render them invisible to subsequent operations and allow them to mismatch with their antecedent unproblematically. When the ellipsis-licensing head is higher in its extended-projection than the head with which ϕ -feature agreement occurs, Spellout (and consequently the decision to elide or not) will be delayed until after the ϕ -features of *be* or auxiliary *have* have been checked against those of T, and the identity requirement enforced by the semantics of ellipsis (cf. Merchant 2001 on the semantics of the ‘E’-feature) may be able to enforce identity between them and their antecedents in the left conjunct. If *be* and auxiliary *have* are inflected lexically, as in Lasnik’s system, they will have already checked their inflectional features in the overt derivation, so that the T head will bear a copy of these features and be non-identical with its antecedent T head, potentially inducing a crash. When the ellipsis-licensing head triggers Spellout immediately, however, its contents will be rendered inflectionally opaque by the deletion/non-pronunciation operation itself, and *be* and *have* display the inflection-insensitivity characteristic of other verbs.

In the following subsections, I elaborate on the third possibility sketched above: namely, that the sensitivity of an elliptical construction to ϕ -features depends upon the relative position of the verb that hosts the ϕ -features and the node that licenses the ellipsis.

3.1.1.1. No *be/have* effects in SCG. One straightforward way of accounting for the different behavior of SCG and LCG in English with regard to tolerating agreement mismatch would be to localize the agreement features associated with the verb on a head external to the verb itself. If this head is excluded from the ellipsis site in SCG it will allow the Gapped verb to differ from its antecedent. Likewise, if it is included in the ellipsis site in LCG, this will ensure that the Gapped verb matches its antecedent. This account would be exactly parallel to the one Merchant gives for the different acceptability of voice mismatch in VPE vs. PseudoGapping.

The actual answer, however, must be somewhat more elaborate than this, for a number of reasons. First, Stripping/Bare Argument Ellipsis is certainly large enough to include the posited agreement head, but does not show *be/have* effects. I return to this problem below.

(165) I'm a doctor, but not my husband.

A second problem is the converse of the first: VPE, which should be approximately the same size as SCG, *does* show *be/have* effects.

(166) *I'm a doctor and so can you.

A potential solution to this second problem may be to distinguish between VPEs of different sizes, as proposed in Sailor 2014. Sailor accounts for the different acceptability of voice mismatch in different VPE contexts by proposing that VPE comes in two sizes, a smaller VPE that excludes the voice head and allows mismatch, and a larger VPE that includes the voice head and does not. Gapping always disallows voice mismatch, meaning that on Sailor's account it should be always larger than the smallest VPEs.

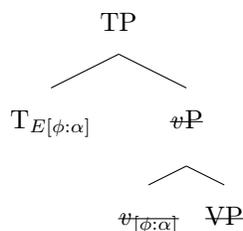
Only in large VPE, according to Sailor's analysis, can *have* and progressive *be* be elided. Sailor's large VPE is rather like (small-conjunct) Gapping in some ways: it prefers coordinate contexts, it disallows voice mismatch, it allows VP modifiers to be interpreted in the ellipsis site, and it disallows strict identity with its antecedent (167).

(167) John shouldn't make himself a martini and Mary ~~make herself~~/*~~him~~ a gimlet.

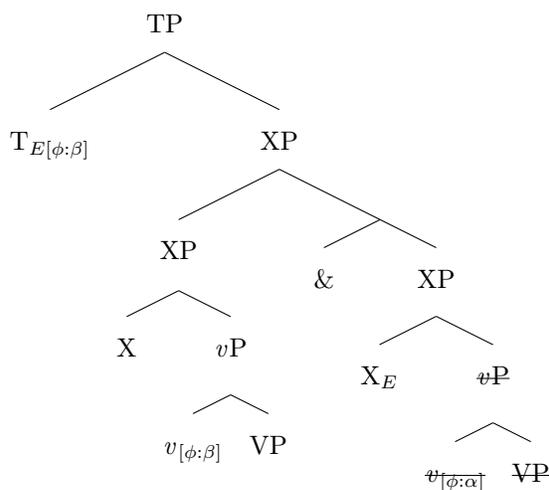
If we assume, however, that VPE is licensed by an ellipsis feature on T (as evidenced by its need for auxiliary support) then even though an elided *be/have* auxiliary will necessarily not raise out of the ellipsis

site (because its landing site is already occupied), T is still present when ellipsis is applied, and consequently Agree can occur, checking the features of the auxiliary (168a). In contrast, if SCG is licensed by a head high in the *vP* domain, T will not be present in the tree when ellipsis applies, and the features of the auxiliary will be rendered inaccessible (168b).

(168) a.



b.



It is independently plausible to suppose that SCG is indeed licensed by a head high in the *vP* domain: SCG occurs without a licensing auxiliary verb, unlike VPE; it has a distinctive information-structural meaning involving topic and focus; and it induces a constituent of the VP (the right remnant) to raise out of it to a position not normally occupied.²

This proposal predicts that PseudoGapping, which contains a finite auxiliary, will behave like VPE and unlike SCG in showing *be/have* effects. This appears to be the case.

(169) a. * John is eating an apple and Mary might ~~be eating an apple~~ too.

²A serious objection to this proposal is that it is not at all clear how T comes to be occupied by the auxiliary in a structure like (168b); while A-movement may be exempt from the CSC, head-movement is certainly not. Perhaps on a Munn (1993)-style analysis of coordination as adjunction this kind of asymmetric head-movement might be possible just in case a potential attractee in one conjunct is elided before the movement-attracting head is introduced into the derivation, rendering the conjunct indistinguishable from an adjunct for the purposes of Agree, but this highly speculative suggestion requires much more thought before being taken seriously.

- b. * John is eating an apple and Mary might ~~be eating~~ a pear.

Thus there is a plausible explanation why *be/have* effects occur in VPE and not in SCG: in the former, the inflectional features of the elided verb co-exist in the derivation with T; while in the latter, these features are elided (or marked for ellipsis) before T is introduced and consequently leave the derivation unchecked.³

3.1.1.2. *Be/have* effects in LCG. More puzzling is the first problem mentioned above, namely that LCG, unlike Stripping, does show *be/have* effects. Assuming that both of these ellipses are approximately clause-sized and delete all the verbal material, it is puzzling that Stripping should robustly tolerate agreement mismatch and LCG not do so.

One possibility, however, is that Stripping is ellipsis of a constituent that is a bit smaller than what is elided in LCG. If so, and if we assume, as proposed in e.g. Chomsky (2008:143) that the featural specification of T is dependent or parasitic on C, then a copy of the mismatched ϕ -features may be present on a C head outside the ellipsis site. If LCG is larger and deletes this (and perhaps every) C, as suggested by its absolute inability to co-occur with a complementizer, then its intolerance of agreement mismatch follows naturally. If in the course of the derivation ϕ -features that come to be valued on T are copied to, inherited by, or percolated up to C, then a portion of the deleted clause will be visible to further syntactic operations even once deletion has taken place provided C is spared, allowing the syntax to “peek” into the deleted portion.

This is notably similar to the analysis in Merchant (2008b) of voice-mismatch in VPE, where the claim is that when the Voice head is excluded from the ellipsis, mismatch is possible. In this case, the copy of the ϕ -features on C outside the deletion site in Stripping permits ϕ -feature mismatch.

What reason might we have for supposing that LCG is deletion of a larger portion of the clause than Stripping? What reason might there be for distinguishing the constituent deleted in Stripping and LCG? Prima facie evidence for this may be the fact that Stripping can at least sometimes be subordinated, e.g. in adjunct prepositional phrases (Frazier & Yoshida *ms*).

- (170) a. John ate the beans like Mary ~~ate the beans~~.

- b. * John ate the beans like Mary ~~ate~~ the rice.

³This account presupposes that a failure of a lexically inflected element to check its agreement features does not induce a derivational crash if those features never need to be interpreted by an interface.

Importantly, in some examples of this kind, a modal auxiliary can be interpreted in the missing portion of the prepositional complement, making it implausible that the structure in question is simply [$_{PP}$ P DP]; in (171a), one easily accessible interpretation is that John was able to write numbers before Mary was able to write numbers, rather than that he was simply able to write numbers before she wrote numbers, and the modal interpretation inside the prepositional phrase is most consistent with it being derived by ellipsis.

- (171) a. John could write numbers before Mary ~~could write numbers~~.
 b. *John could write numbers before Mary ~~could write~~ letters.

If this analysis is on track, then the fact that ellipsis is generally insensitive to ϕ -feature mismatch need no longer be regarded as a property of ellipsis *per se*; rather, it is a consequence of the fact that in almost all cases (viz. except when the highest C that shares features with T is deleted) the ϕ -features of T are not strictly *contained* in the ellipsis site. On an account of this kind, ϕ -features are not special in kind, but only turn out to be relevant to ellipsis identity in the rare case that either a lexically-inflected element fails to check its features before the head inducing deletion is introduced, or the highest head onto which these checked features wind up (whether by percolation or simply because T and C are different Merge points of the same head) is also deleted.

3.2. A Different Pattern in Hebrew

The puzzle is complicated further by cross-linguistic data. In this section, I discuss the behavior of small- and large-conjunct Gapping in Modern Hebrew, and argue that an effect qualitatively similar to the *be/have*-effect seen in English Gapping obtains in this language. Curiously, however, the direction of the effect is reversed, with limited agreement-matching required in small-conjunct Gapping and not in large-conjunct Gapping. Here I present the Hebrew pattern in contrast to the English one, and present an analysis that derives the different pattern from independently plausible language-particular differences between verb-movement and the size of the elided constituents in Gapping in the two languages.

The Hebrew verb differs from the English verb in a number of respects. The Hebrew verb is considerably more morphologically complex than the English verb: it agrees with its subject in person, number and gender in the past tense, and in number and gender in the present tense. A partial agreement paradigm for the past tense of *gidel* ‘grow/raise’ is given in table (3.1).

Table 3.1. Partial Hebrew Agreement Paradigm

	Masculine	Feminine
1st Person	gidalti	
2nd Person	gidalta	gidalt
3rd Person	gidel	gidla

Syntactically, the Hebrew verb occupies a higher surface position than the English main verb, moving to T in the overt syntax (Doron, 1983; Shlonsky, 1987). Hebrew does not use auxiliary verbs in active indicative clauses, and the rare contexts in which auxiliaries occur are outside the scope of this study.

Hebrew, like English, possesses Gapping, exemplified in (172). The Hebrew construction shares the basic distinctive properties of Gapping: most notably, it leaves both a left and a right remnant, and is degraded in subordination (172b) and in embedded contexts (172c)^{4,5}

- (172) a. Yosef gidel gezerim ve Yael, khatzilim.
 Yosef raised cucumbers and Yael, eggplants.
 Yosef raised cucumbers and Yael, eggplants.
- b. *Yosef gidel gezerim biglal she Yael, khatzilim.
 Yosef raised cucumbers because that Yael, eggplants.
 Yosef raised cucumbers because Yael, eggplants.
- c. *Yosef gidel gezerim ve Tal omer she Yael, khatzilim.
 Yosef raised cucumbers and Tal thinks that Yael, eggplants.
 Yosef raised cucumbers and Tal thinks that Yael, eggplants.

Hebrew also appears to exhibit an ambiguity between small- and large-conjunct Gapping. Hebrew Gapping examples can be successfully subjected to both large- and small-conjunct tests, but with appropriately differing interpretations. For example, ATB extraction from both conjuncts is possible (173a), as is separate topicalization within each conjunct (173b), with interpretational differences that informants report to correspond to the equivalent English differences.

- (173) a. Et mi David tsiyer ba tsiyur ve Yosef ba sirtut?
 ACC who David painted in painting and Yosef in drawing?
 Who did David portray in a painting and Yosef in a drawing?
- b. Et ha gezerim, Yosef megadel ve et ha khatzilim, David.
 ACC the cucumbers Yosef raises and ACC the eggplants David

⁴Some subjects marginally accept examples like this.

⁵Thanks to Aya Meltzer-Asscher for the judgments reported in this section.

The cucumbers, Yosef raises, and the eggplants, David.

In certain contexts, Hebrew Gapping exhibits something like the *be/have*-effect found for English, but with a number of surprising differences. In particular, it obtains for main verbs, unlike English's, which obtains only for auxiliary verbs; it obtains in the past tense but not in the present, while English's is apparently indifferent to tense.

Relatedly, it is principally sensitive to the single ϕ -feature of Person.⁶⁷ This property is difficult to distinguish in English because of the latter language's impoverished agreement paradigm, though see fn. (1) of this chapter above for some discussion.

Most surprisingly of all, however, *which* kind of Gapping is subject to the *be/have*-like effect differs in Hebrew: here it is in small-conjunct Gapping that limited agreement-matching is required, rather than in large-conjunct Gapping.

For straightforward Gapping examples like (174a), informants report ambiguous acceptability: with a strong intonational break between the antecedent and Gapped conjuncts, the examples improve, while without it, they are degraded. A similar intonational break is known to bias English speakers to a large-conjunct interpretation of a Gapping configuration. Thus provided the source of the intonation break is similar across the two languages, viz. the presence of a separate CP that the phonological component parses into an independent intonational phrase, this alone suggests that person mismatch between the subject of the Gapped clause and its antecedent induces degradation in small-conjunct Gapping. Note that no such effect obtains for person-mismatched subjects in present-tense Gapping constructions (174b).

- (174) a. ??Yosef gidel gezerim ve ani/ata/at, khatzilim.
 Yosef raised cucumbers and I/you(MASC)/you(FEM), eggplants.
 Yosef raised cucumbers and I/you, eggplants.
- b. Yosef megadel gezerim ve ani/ata/at, khatzilim.
 Yosef raises cucumbers and I/you(MASC)/you(FEM), eggplants.
 Yosef raises cucumbers and I/you, eggplants.

More concretely, when small-conjunct tests are applied to examples like (174a), the degradation becomes obvious, as in (175a).

⁶⁷These properties are not independent, since the present tense in Modern Hebrew lacks Person-marking.

⁷For some subjects number mismatch may induce a less serious and more difficult to judge degradation. Gender mismatch is tolerated apparently universally.

- (175) a. *Et mi David tsiyer ba tsiyur ve ata/at ba sirtut?
 ACC who David painted in painting and you(MASC)/you(FEM) in drawing?
 Who did David portray in a painting and you in a drawing?
- b. Et mi David tsiyer ba tsiyur ve Yosef ba sirtut?
 ACC who David painted in painting and Yosef in drawing?
 Who did David portray in a painting and Yosef in a drawing?

Conversely, when large-conjunct tests are applied to similar examples, they become unambiguously acceptable, as in (176).⁸

- (176) Et ha gezerim Yosef gidel ve et ha khatzilim, ani/ata/at.
 ACC the cucumbers Yosef raised and ACC the eggplants, I/you(MASC)/you(FEM).
 The cucumbers, Yosef raised, and the eggplants, I/you.

What is curious about the pattern is that in English, morphological mismatch between the antecedent verb and the form the Gapped verb would assume were it overt is tolerated in small-conjunct Gapping and not in large-conjunct Gapping, while in Hebrew, the same kind of mismatch is tolerated in large-conjunct Gapping and not in small-conjunct Gapping. The fact that the Hebrew effect occurs in main verbs and the English one only in auxiliary verbs, or that the Hebrew effect is restricted to the past tense, are likely attributable to the very different morphological paradigm structures of the two languages. Thus although these facts of course require explanation, a *prima facie* plausible explanation seems feasible. In contrast, the reversal of morphology-sensitivity across the two Gapping patterns between English and Hebrew is much more puzzling.

3.2.1. Hebrew vs. English

What could plausibly be the difference between English and Hebrew in this respect?

First, we can account for the difference between English and Hebrew LCG in terms of the proposal outlined above for English if Hebrew LCG is somewhat smaller than English LCG; in particular, if it is small enough to exclude a C head bearing ϕ -features that have been copied from T. There some reason to suspect that this may be the case; Preminger (2009)'s proposal that in Hebrew, unlike in English, A'-movement

⁸In formal contexts fronting of this kind would require further head-movement of the T+v+V complex to C (see Doron 2000), but my informants accepted topicalization without T-to-C movement in an informal register.

lands in a position below the complementizer and only utilizes Spec,CP as an escape hatch in long-distance movement, predicts this difference if the movement of Gapping remnants is A'-movement, which is plausible.

Accounting for the difference between English and Hebrew SCG is a less simple proposition. An analysis of SCG in Hebrew is bounded by a number of conditions. First, because the usual position of the main verb in Hebrew is in T, it is more problematic for a small conjunct derivation to account for the absence of the verb in the right conjunct. Three possibilities exist: either (i) the VP is deleted before the introduction of T (as I argue above for English), (ii) the elided category is large enough to include T, or (iii) Hebrew SCG involves ATB movement of the verb.

If head-movement is subject to the CSC, (i) is excluded, because only the V from the left conjunct will be available to move to T. If (ii) were the case, the ability of adverbials to scope over the coordination would be surprising, since an adverb like *temeyd* 'always', which appears to be TP-adjoined because it surfaces between the subject and the verb, should have to be interpreted individually in each conjunct, if the conjuncts properly contain a TP apiece. But a wide scope reading of the adverbial is possible for (177). A structure for (177) in which the conjuncts are TPs and *temeyd* adjoined to the coordinated TP could also support this reading, but this would require the right-conjunct subject *David* to move from Spec,TP to a TP-adjoined position in order to yield the observed word order, and is thus likely to be excluded for antilocality reasons (cf. the discussion of TP-adjoined embedded topics in Lasnik & Saito 1992).

- (177) Yosef bevaday nose'a be auto ve David be autobus.
 Yosef probably rides in car and David in bus.
 Yosef probably take a car and David the bus.

For this reason, I pursue (iii): in Hebrew (perhaps unlike in English) SCG involves ATB movement of the two conjuncts' Vs to T. If this is the case, the reason for Hebrew SCG's resistance to person mis-matching most likely follows from the need to spell-out the ATB-moved V.

The ability of very low adverbs to go missing in Hebrew SCG indicates that some deletion may be occurring in addition to ATB verb movement in Hebrew SCG. In (178a), the VP-level adverb *maher* 'quickly' can be interpreted in the right conjunct, though this is not the most accessible reading. This is only suggestive evidence, of course, since it is not inconceivable that the movement of the verb out of *vP* in this example is actually remnant phrasal movement rather than head-movement.

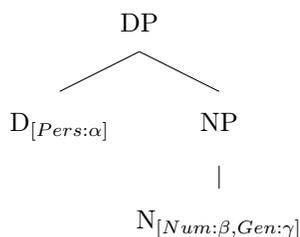
- (178) a. Et mi David tsiyer maher ba tsiyur ve Yosef ba sirtut?
 ACC who David painted quickly in painting and Yosef in drawing?
 Who did David portray quickly in a painting and David in a drawing?

This introduces a number of analytical complications, however. First, why is only the Person feature required to match? We would expect the verb to need to agree with either all features of both subject (if it can probe them via Multiple Agree) or only the features of the left conjunct subject (if Agreement is dependent on the Spec-Head relation). Furthermore, how is the right conjunct VP deleted while still allowing the relevant V an opportunity to move to T? It would be undesirable from a theoretical point of view for T to be able to carry a peculiar ellipsis feature enforcing deletion of just one conjunct of its coordinated complement. It turns out that both issues may have the same resolution.

I propose that the explanation for the fact that only Person must match in Hebrew SCG is to be found in the geometry of the noun phrase and in the order of operations in a derivation.

There is independent reason to believe that Person is a feature of D (Carstens 2003, Baker 2008) and that, in Hebrew at least, Number and Gender are located lower, on N (Ritter, 1993), as schematized in (179).

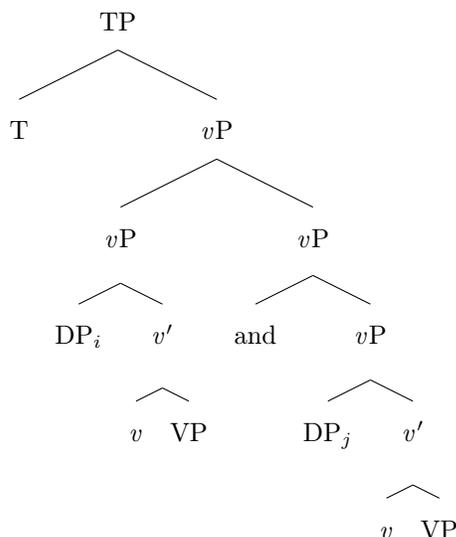
(179)



Suppose, as a first pass, that while T can Probe multiple Goals simultaneously (see e.g. Hiraiwa 2001), it must Probe for a single category of head (e.g. D, N, etc.) and thus can only value ϕ -features from only one category of head at a time. If this is the case, then when T is introduced, it can trigger V-to-T movement, Agree with the Person features in the D heads of the two *v*P subjects, and attract the left conjunct's subject into its Specifier, but it will have to wait to value its Person and Number features until a subsequent derivational step. At this point the left conjunct subject will be structurally closer to T and, assuming Spec-Head agreement is an option, T's Gender and Number features will depend on the left subject alone. This suffices to enforce Person matching and permit Gender and Number mismatch in Hebrew SCG, but introduces an additional problem. Why do the two conjunct subjects DP_i and DP_j count in a structure

like (180) as equidistant from T for the purpose of Agree but the left conjunct subject as closer to T for the purpose of movement to Spec,TP?

(180)



Another way of implementing this obviates this issue and has the added advantage of not requiring the deletion of the right conjunct verb phrase to be triggered non-locally by T. If (at least in Hebrew) it is the *v* element of the eventual T+v+V complex that performs Person agreement, the same result can be derived. Both *vs* will value a Person feature from their Specifiers and then ATB-move to T; subsequent agreement will be with the closest subject, viz. the one that has moved to Spec,TP. On an account like this, agreement with Person happens in the lower phase and is derivatively carried up into T.

Reason to suspect that something like this might be the case is that in Hebrew some non-finite verb forms (namely the so-called *beynomi* participles that are also the basis of the present tense) agree in Gender and Number but not in Person, while the associated auxiliary verb *haya* does not occur in present tense where Person is unmarked (Berman, 1980). If *v* is the base position of *haya* which agrees with its Specifier in Person and then moves to T, it may render the Person features of the subject unavailable for later agreement. According to Schlonsky 1997, the auxiliary in these constructions does indeed originate in a higher verbal head and moves to T while the participle raises only to a lower position.

Moreover, if Person agreement happens at *v*, we can reduce the difference between Hebrew and English SCG to a single parameter of the behavior of the head that licenses SCG: in English it licenses deletion of itself as well as its complement, while in Hebrew it licenses deletion only of its complement. This difference

is the sort of thing that could plausibly be learned from the morphology: because T is overwhelmingly an affix on the verb in Hebrew, a version of *v* that deleted itself would generally result in a Stranded-Affix Filter violation. (That is, Hebrew T attracts head-movement quite generally, while English T normally does not.)

This difference then has the result that two verbs bearing incompatible Person specifications can end up in T, causing it to be unable to spell out, but agreement of the other ϕ -features occur after this head-movement and will thus always be with the DP in Spec,TP.

In the following sections I discuss support for a number of surprising predictions this analysis makes, including for languages other than English and Hebrew.

3.3. The EPP is different

The proposal sketched above for the unavailability of person mismatch in small-conjunct Gapping in Hebrew may appear to be too powerful—why does it not also exclude agreement mismatch in English small-conjunct Gapping, on the assumption that the EPP property of T causes it to enter into an Agree relation with the DP it attracts into its specifier? While I do not have an explanation for why the EPP does not pattern like other Agree relations, in this section I present some independent evidence that it does not, and thus that the above analysis should not also rule out agreement-mismatch in English small-conjunct Gapping.

On the one hand, it has been independently proposed that the EPP requirement is not actually motivated by a feature-matching operation that applies in the syntax but is instead a PF condition of some kind (Merchant, 2001; Van Craenenbroeck & Den Dikken, 2006). In particular, the fact that subject islands are ameliorated under sluicing (181) can be explained if the subject island effect is a sub-case of the derived position island effect and subjects do not need to move to Spec,TP in an elided clause.

- (181) a. * Which Marx brother is a biography of going to be published this year?
 b. A biography of one of the Marx brothers is going to be published this year—guess which.

However, the ability of Sluicing to ameliorate other island effects that are not easily amenable to this kind of explanation (viz. that a constituent hosting an extraction site fails to move in elided structure and consequently does not introduce a derived-position effect) make the above argument inconclusive. Van Craenenbroeck & Den Dikken (2006) also present a stronger argument that elided I(/T) does not induce EPP-movement, one which depends on asymmetries in NPI licensing between elided and unelided clauses (182).

The acceptability of the NPI subject in the fragment answer in (182)a, presumably licensed by the sentential negation in *didn't*, contrasts with its unacceptability in the overt equivalent of the fragment answer, (182)b. But if the NPI *any of the printing equipment* in (182)a never moved to Spec,IP when IP is elided, and thus never occupies an A-position above the negation, the contrast in (182) follows.

- (182) a. What didn't work? — Any of the printing equipment.
 b. *Any of the printing equipment didn't work.

Similarly, the possibility of subGapping in English, which does not appear to involve deletion, argues that the EPP requirement is satisfied by the presence of a DP in Spec,TP and does not motivate T to enter into any relation with all the thematic subjects in T's complement domain. The fact that T with an expletive subject can show first-conjunct agreement makes the same point (183).

- (183) There was a man and several women in the garden.

In this section I present a piece of further evidence that the EPP property behaves differently under ellipsis than true feature-matching does, and thus that the account of Hebrew SCG above need not bear on the ability of the EPP property of T to tolerate SCG in English.

Observe that when T's EPP property can be fulfilled either by movement of the thematic subject or by the insertion of an expletive, mismatch behaves asymmetrically under VP ellipsis. When VPE's antecedent is C-commanded by a T whose specifier is an expletive, but the VPE itself has the thematic subject in its Spec,TP (184a), the example is degraded relative to the reverse configuration with the expletive in the Spec,TP in the VPE'd conjunct (184b).

- (184) a. ?? J told me there was a girl in the room and indeed a girl was.
 b. J told me a girl was in the room and indeed there was.

This is evidence that the EPP is not sufficient motivation for T to establish a relation with a constituent inside an ellipsis site, at least for base structures for which *there*-insertion is a possible alternative.⁹ The claim

⁹As discussed in Hunter & Yoshida (to appear), however, this may not necessarily extend to all cases of expletive insertion.

- (1) a. It seems to Mary's friends that he_i is a great linguist, but not to John_i's friends.
 b. *He_i seems to Mary's friends to be a great linguist, but not to John_i's friends.

by Lasnik (2001a) to the contrary relies upon examples like (185a) where *there*-insertion is independently impossible.

- (185) a. *Mary said she can't swim, even though (really) can.
 b. *There can Mary swim.

In contrast to these cases with expletive subjects, when the element occupying T obligatorily bears agreement features from a DP in its specifier, the agreement congruity of T's multiple complements is relevant to a sentence's acceptability, even when no deletion applies. Evidence for this comes from subGapping, where agreement mismatched thematic subjects are noticeably less acceptable than matched subjects (186).

- (186) a. ?? The children don't like the beans and John dislike the rutabagas.
 b. The children didn't like the beans and John dislike the rutabagas.

Overall then, the EPP property of T on its own does not regulate the distribution of thematic subjects in elliptical constructions, and cannot be taken to be subject to the antecedent-ellipsis identity requirement whether it is deleted along with its complement or not.

3.4. Features or forms?

In English and Hebrew, it is not obvious how to determine whether the cause of degradation in certain person-mismatched Gapping configurations is the different featural specification of the Gapped verb or its different form. Under the hypothesis that the English auxiliary verbs are lexically inflected, it is conceivable that the form difference between the Gapped auxiliary and its antecedent is crucial for inducing mismatch degradation. In Swedish, however, the *be* verb has only the single finite present-tense form *är*. If Swedish shows a *be/have* effect in large-conjunct Gapping like English does, this would be strong evidence that it is the agreement *feature* that matters, not its morphological exponence. In this section, I demonstrate that Swedish

If *he* has not raised to Spec,TP inside the ellipsis site in (1b), it is unclear where the apparent Condition C violation in this example is coming from; insertion of expletive *it* is apparently not a possibility. Note however that to save this example by expletive insertion, the finiteness of the embedded clause in the sluice will have to mismatch that of its antecedent, since expletive *it*-insertion is not possible when *seem* selects a non-finite complement clause. It is thus possible that the degraded status of (1b) is the result of this parallelism failure.

shows a *be/have* effect in large-conjunct Gapping just as English does, indicating that it is the abstract ϕ -features that matter for the acceptability of this construction, even in a language that never realizes the ϕ -features in question on a verbal element.

Like English, Swedish allows Gapping (187) and, again like English, it exhibits the Gapping scope ambiguity—(187) can describe a situation where John is unable to speak Spanish, and Mary is unable to speak Japanese, or it can describe a situation where John can speak Spanish and Mary can speak Japanese but, unsurprisingly, they must agree on a language to use between them that they both speak.¹⁰

- (187) John kan inte tala spanska och Mary japanska.
 John can not speak Spanish and Mary Japanese
 John can't speak Spanish and Mary Japanese.

Again like in English, the Gapping scope ambiguity in Swedish is sensitive to syntactic manipulations, and can be made to disappear under approximately the same conditions that modulate its availability in English.

Crucially, just as in English, syntactic manipulations that force the distributive-scope reading (in 188a, the inclusion of an expressive adverbial remnant that obligatorily occurs higher than the *vP* level) induces degradation with the *be*-verb *är*, and not with other verbs (188b). That is, something like the *be/have* effect in English large-conjunct Gapping obtains also in Swedish, in the absence of overt agreement morphology on the *be*-verb.¹¹

- (188) a. *Som tur var är John sjuk, men tyvärr också jag.
 fortunately is John sick, but unfortunately also I
 Fortunately John is sick, but unfortunately so am I.
- b. Som tur var försvann John, men tyvärr också jag.
 fortunately vanished John, but unfortunately also I
 Fortunately John vanished, but unfortunately so did I.

No such degradation ensues with manipulations that yield the wide scope reading (189).

- (189) Vem gav jag en halsduk och Mary en klocka till?
 who gave I a scarf and Mary a watch to?

¹⁰Thanks to Matthias Ingelstam for the judgments reported in this section.

¹¹This fact may also constitute some evidence in favor of the common assumption that ϕ -agreement is universal even when not realized (Chomsky, 2000; Sigurðsson, 2003), and against proposals such as Markman (2009) that the presence of abstract agreement is parameterized cross-linguistically; though at best suggestive evidence, because Swedish does have gender/number agreement in its nominal system and cannot thus be an “agreementless language” *sensu stricto*.

Who did I give a scarf and Mary a watch?

Why would the agreement-*featural* properties of the *be*-verb differ from those of other verbs in Swedish and English? In English, the question is relatively straightforward, since *be* is syntactically different from other verbs in always raising to T, but in Swedish, all verbs move for V2 reasons. It is unclear what evidence could lead an acquirer of Swedish to posit a different agreement mechanism for *är*, but one possible distinction is that *är* is also used in the formation of certain periphrastic constructions, such as one form of the passive. If this is the crucial distinction, it predicts that the other Swedish verbs with both main and auxiliary functions may show *be/have* effects as well.

Merchant (2015) notes similar facts about the behavior of *be* in elliptical code-switching contexts, and similarly concludes that it cannot be the *form*-identity of an elided *be*-verb with its antecedent that determines its acceptability under ellipsis. His examples involve tense-mismatch between potentially an elided *be*-verb and an antecedent in Modern Greek, so already form-identity is analytically unviable, but as the contrast between (190a) and (190b) shows, even when the tense form of the antecedent is unchanged, mismatch in its tense value (as marked in 190a by the particle *tha*) can still determine the acceptability of ellipsis of *be*.

- (190) a. I Maria *tha* ine sto parti, and her sister will, too.
 The Maria FUT is at.the party
 Maria will be at the party, and her sister will, too.
- b. *I Maria ine sto parti, and her sister will, too.
 The Maria is at.the party
 For: Maria is at the party, and her sister will be, too.

Merchant proposes that the inability of *be* to delete under tense mismatch with its antecedent follows from a constraint on the re-binding of variables (in this case, the T variable) between an ellipsis and its antecedent, such that whatever mediates this re-binding (in this case *be*) must be overt. Provided non-verbal predicates cannot have their tense values bound by T directly, the constraint on *be*'s appearance is explained. (The full paradigm in Merchant (2015) is quite complex; see that work for detailed argumentation.) If Merchant's analysis of this construction is on the right track, it may be that some agreement features must be valued even in languages that never express them morphologically.

I leave these interesting prospects to future research for the moment; the contrasts above suffice to exclude a strictly form-based interpretation of the *be/have* effect in English large-conjunct Gapping.

3.5. Conclusion

This chapter has addressed rare instances of agreement-sensitivity in Gapping in several languages, and their interaction with the small-/large-conjunct distinction adopted following Potter et al. (*under review*) and supported in the preceding chapter. Across languages, such affects appear to surface either when there is no head in the C domain above the ellipsis site on which the ϕ -features from T (from the subject DP) can be recovered, or when Gapping is derived from small conjuncts from which the verb must ATB-raise and consequently realize conflicting feature specifications from its two subjects. While many questions deserve further scrutiny, the fact that ϕ -features are even rarely relevant to the acceptability of Gapping sentences suggests that there may not be a distinction in kind between different classes of syntactic features with regard to their relevance for the antecedent-ellipsis identity relation, but rather that identity of any feature can in principle be required, but the feature-sharing properties of the functional heads in the clausal spine conspire to make ϕ -features recoverable in almost all typical cases of ellipsis. For present purposes, it suffices to conclude that ϕ -features are at least sometimes relevant to the grammar of Gapping, setting the stage for the inquiry pursued in subsequent chapters: namely, whether and how they are utilized in the processing of Gapping on-line.

CHAPTER 4

Agreement in the antecedent retrieval of Gapping

The preceding chapter has presented the case for a number of points in the syntactic analysis of Gapping. In particular, I have tried to show that Gapping in English should be analyzed as a kind of ellipsis; that it is ambiguous between small- and large-conjunct coordination structures, expanding upon arguments from Potter et al.; and that the unpronounced portion of a Gapping sentence contains agreement features which are, in rare circumstances, relevant to the calculus of grammaticality. In this and the following chapter, I consider the implications for these conclusions for the processing of Gapping sentences. In particular, if agreement features are represented in the unpronounced portion of a Gapping sentence, the parser may utilize them in the antecedent retrieval process, or in the anticipatory process of positing a Gapping structure in a temporarily ambiguous string. If the parser utilizes agreement information in processing Gapping examples, this would not only provide evidence that such information is represented in the Gapping site but also, and more uncontroversially, allow us to distinguish between competing hypotheses about how antecedent retrieval for elided linguistic material is carried out.

4.1. General introduction

This chapter reports a series of experiments to study the on-line process of antecedent retrieval in Gapping. The question these experiment studies aim to address is whether the parser utilizes the same representation the grammar uses for the elided structure in Gapping¹. This question breaks down into two parts: (i) is the parser sensitive to all and only the grammatically relevant featural information about the elided conjunct and its potential antecedent in the course of antecedent retrieval and, if not, (ii) is this because the retrieval mechanism is syntactically unconstrained, or because it can utilize cues that, while not syntactically decisive,

¹For the possibility of the parser utilizing representations different from those licensed by the grammar, see e.g. Ferreira et al. (2002) *et seq.*

are present (and reasonably good, if still only probabilistic, cues) in the syntactically licit representations it builds and accesses. All of the experiments ask one or another version of this (two-part) question.

4.1.1. Rationale

This is related to the first, theoretical syntax part of the thesis in the following way. The first part of the thesis asks principally how agreement information is represented in Gapping configurations, and what this can tell us about the grammar of Gapping—provided it should count as ellipsis (which the earlier portions attempt to argue), what this can tell us about how the deletion operation yielding ellipsis is and how it interacts with other PF-branch phenomena, in particular with vocabulary insertion. The second part of the thesis asks how agreement information is processed in Gapping configurations, and what this can tell us about the parser’s antecedent retrieval mechanism—whether agreement information here is processed like agreement information elsewhere, whether the parser uses the same kind of representations the grammar uses or, if not, in what ways these representations are different, and how the parser’s sensitivity to agreement information in this elliptical construction interacts with the parser’s sensitivity to configurational and argument-structural constraints.

The Hebrew pattern described above suggests that Gapping can in principle require matching of some agreement-related features, and we would expect the parsing mechanism to have some way of handling this constraint / implementing it in realtime. If this kind of sensitivity shows up even in a language like English without the grammatical constraint, this would suggest that the parser makes use of agreement information wherever UG allows it to be relevant, rather than just where it’s relevant in the language being parsed.

It is notoriously difficult to make valid inferences from processing results to the form of the grammar. However, if the parser displays sensitivity to agreement-mismatch in Gapping configurations, this would suggest that the grammar licenses a representation (which the parser operates over) for the elided material that includes morphosyntactic information. More interestingly, if the parser exhibits sensitivity to grammatical constraints, such as those involving islands, while exhibiting such agreement effects, this would be stronger evidence in support of this claim, because this would indicate that the parser produces a representation of the elided material containing both agreement information and the structural information necessary to support syntactic sensitivity during parsing.

4.1.2. Agreement mismatch in parsing

Prior research on agreement mismatch in non-elliptical contexts (Wagers et al., 2009) has provided evidence that subject-verb agreement information is computed rapidly online, and that the mechanism by which upstream agreement information is retrieved is fallible and subject to interference effects. Wagers et al. (2009) claim that a cue-based parsing account in which incoming material triggers relevant upstream material to be retrieved by feature-matching from a content-addressable memory store (Lewis & Vasishth, 2005a; Lewis et al., 2006) best accounts for their findings. Similarly, some other research (e.g. Martin & McElree (2008)) indicates that a similar content-accessible memory system may be used to retrieve the antecedent of an ellipsis site as well. If this is the case, finding similar agreement-sensitivity effects in the context of ellipsis would indicate that the representation the parser attempts to produce for the elided material is a morphosyntactic representation rather than a purely semantic one. That is, such a finding would indicate that the target of retrieval in this elliptical context is the memory representation of the antecedent verbal constituent including its agreement features, and not merely the grammatically relevant subset of the feature structure of that constituent containing semantic and argument-structure-related features. The experiments below aim to test what subset of the feature structure of the antecedent is retrieved in recovering the elided material in Gapping, and how agreement-related ϕ -features interact with structural constraints and argument-structural θ -roles in the retrieval process. The principal competing account of antecedent retrieval in elliptical constructions is the so-called search-and-copy class of theories (e.g. Gronlund et al. 1997, McElree 2001, 2006, McElree & Doshier 1993). On accounts of this type, upon encountering evidence for the presence of an ellipsis (or reaching a parsing step that triggers the prediction of ellipsis in the absence of bottom-up evidence) the parser, rather than performing a feature-matching operation on a memory store of recently processed constituents, backtracks through a syntactic (e.g. Frazier & Clifton 2001) or discourse (e.g. Kehler 2000) representation until it finds a suitable antecedent; that is, an antecedent that is compatible with the category (but cf. Yoshida 2010) and external syntax of the ellipsis. It subsequently copies this representation into the representation under construction in the position corresponding to the detected or predicted ellipsis. The difference between content-based feature-matching retrieval accounts and search-and-copy accounts of ellipsis antecedent retrieval thus boils down to (i) what is searched, a memory store of linguistic representations or

a properly linguistic representation itself, and (ii) whether the reinsertion or reintegration of the found antecedent material into the representation under construction is accomplished by re-activating a previously built representation in a position corresponding to an ellipsis or by building an identical new structure in that position.²

Abstracting away, for the moment, from concerns about what is searched and how what is found is re-integrated (to which we will return below), the overall aim of these experimental studies on Gapping is to learn something about the relationship between the grammar and the parser—to what extent the parser is guided by the grammar, to what extent it may disregard it, and to what extent these two modes of behavior, following and departing from the grammar, can coexist and interact in the operations of retrieval and structure building, in this limited context. In particular, we know a number of facts about the grammar of Gapping: it is (usually) insensitive to agreement in English, but sensitive to agreement in various ways in other languages; it is sensitive to the argument-structure of the elided and antecedent verb in English as elsewhere; and it is licensed in a structurally restricted range of contexts.

And we know a number of facts about antecedent retrieval in parsing, both as it relates to agreement features and as it relates to elliptical constructions in general and Gapping more particularly: agreement features are used actively in retrieval and are confusable in a way consistent with a cue-based parsing explanation employing a content-addressable memory store of previously processed linguistic material; the antecedent of elliptical constructions appears to be retrieved using a similar content-addressable mechanism; but Gapping appears to involve a cost for retrieving larger antecedents, unlike other similar constructions that have been studied. How the parser responds to agreement mismatches in Gapping constructions, then, has the potential to improve our understanding of how the former set of facts relate to the latter.

²A parallel might be drawn between these accounts on the one hand and the multidominance/copy-theory accounts of movement in theoretical syntax. It also bears noting that the two dimensions of difference between content-based retrieval and search-and-copy accounts define four possible classes of accounts, two quadrants of which are to the author's knowledge relatively unexplored.

4.2. Long-distance interpretations

The experiments reported in this section investigate whether experimental subjects are able to access long-distance Gapping readings of sentences containing embedded finite clauses, and also whether the presence of an overt complementizer influences the availability of the long-distance interpretation.³

4.2.1. Introduction

The goal of the experiments reported in this chapter is to investigate whether Agreement information is utilized by the parser in its antecedent retrieval process for Gapping. An ideal testing ground for this question is in so-called Long-Distance Gapping, where Gapping applies across a clause boundary, as in (191a), because in examples that possess a potential long-distance reading, a short-distance reading (191b) is also available, and usually preferred.⁴ For some speakers, though not all, such sentences have two possible readings: a more accessible short-distance reading (*Pat thinks [Sam drinks gin and Kim ~~drinks~~ vodka]*) and a less-accessible long-distance reading (*Pat thinks Sam drinks gin and Kim ~~thinks~~ Sam drinks vodka*).

- (191) a. Pat thinks Sam drinks gin, and Kim ~~thinks~~ Sam drinks vodka.
 b. Pat thinks Sam drinks gin, and Kim ~~drinks~~ vodka.

If agreement information is utilized in antecedent retrieval in Gapping, we would expect to see interference between the ϕ -feature specifications of the two potential antecedents in cases where both the short and long-distance readings are available. But the availability of readings such as (191a) is contentious.

Examples of long-distance gapping across a tensed clause boundary have been reported as fully acceptable (Pesetsky (1982), Richards (1997a)) and as fully unacceptable (Jayaseelan (1990), Abe & Hoshi (1995)). Determining whether they are accessible to experimental subjects is an important preliminary to employing them to test Gapping's on-line processing. Some approaches to Gapping make the more subtle prediction that an overt complementizer in the antecedent of the missing portion of a Gapping sentence should either cause or exacerbate the degradedness of Gapping across a tensed clause (Wyngærd (1993), Johnson (2003)). Since this observation, if correct, can provide a means to test whether any agreement-sensitivity found in the

³This section reports joint work with Katy Carlson.

⁴In the short-distance reading corresponds to the Gapped clause and its sister/antecedent are co-embedded under the matrix clause, while in the long-distance reading the Gapped clause is the sister of the matrix clause.

processing of Gapping interacts with structural constraints during antecedent retrieval, it is worth testing as well.

Importantly, the ability to access long-distance Gapping as the final interpretation of a stimulus is not a necessary correlate of this structure's availability to the parser. For instance, it is conceivable that the parser might consider this interpretation of its input string but never actually adopt it. If this were the case, long-distance Gapping readings of these kinds of sentences should not be introspectively available, but evidence for the parser's considering these readings might be found in on-line measures. However, if long-distance Gapping readings *are* available to experimental subjects, this is strong evidence that these parses are at least considered in on-line parsing. Therefore, ascertaining whether experimental subjects can access these readings rapidly is a useful preliminary to more indirect behavioral measurements.

4.2.2. Forced choice (Y/N)

An experiment was carried out to investigate whether comprehenders can access long-distance Gapping readings in on-line tasks. Furthermore, as a preliminary to experiment (4.3.4) below, the influence of intervening complementizer *that* on the availability of long-distance readings was also investigated, in the same task.

4.2.2.1. Design and Materials. Materials consisted of audio recordings of ambiguously short/long-distance Gapping sentences (n=16) with a finite embedded clause in which the Gapping remnants were a subject (either the lower or higher subject) and a direct object.

The prosody of the stimulus sentence was manipulated to contain focal stress in one of two patterns, to bias comprehenders toward either the short-distance reading or the long-distance reading. In addition to this, the presence or absence of complementizer *that* before the embedded clause was cross-varied, for a 2×2 design.

(192) The warden supposes (that) the florists drive a pickup truck and the editor a midsize sedan.

- a. Does the editor suppose the florists drive a midsize sedan?
- b. Does the warden suppose the editor drives a midsize sedan?

Focal stress prosody in the stimulus sentences was manipulated such that each sentence occurred in one of two prosodic patterns. All sentences possessed focal stress on the Gapping remnants, as well as on the

direct object of the unreduced first embedded clause. Additionally, focal stress was placed on either (193a, short-distance bias) the subject of the first embedded clause or (193b, long-distance bias) the subject of the matrix clause.

(193) a. The warden supposes (that) the FLORISTS drive a PICKUP truck and the EDITOR a midsize SEDAN.

b. The WARDEN supposes (that) the florists drive a PICKUP truck and the EDITOR a midsize SEDAN.

Representative pitch tracks for the prosodic manipulation are shown in (4.1), for the matrix and embedded subject accent respectively. Stimuli were read aloud by a single female speaker of American English.

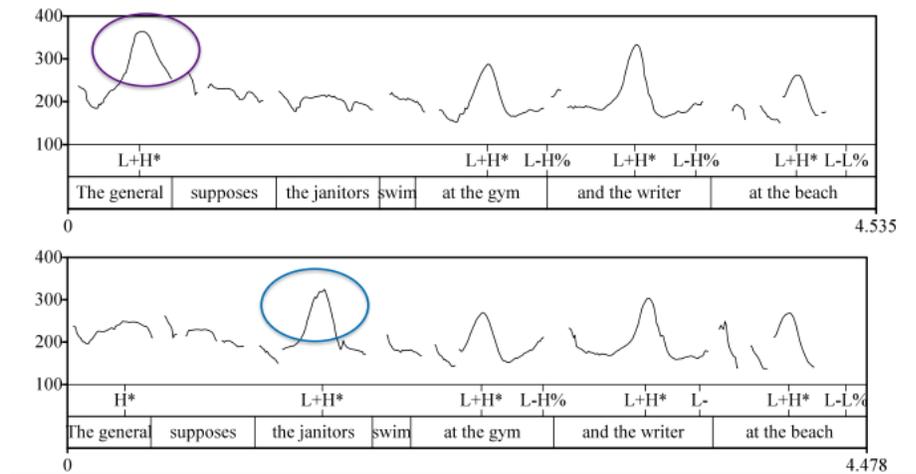


Figure 4.1. Representative Pitch Tracks

Finally, presence vs. absence of complementizer *that* was cross-varied with the prosodic manipulation.

4.2.2.2. Procedure. In an auditory-presentation forced-choice task, subjects ($n=48$) listened to sentences containing a potentially ambiguous short/long-distance Gapping construction and responded to a polar question to which the correct answer was *yes* under only one Gapping interpretation, either under the long-distance reading as in (192a) or the short-distance reading (192b). Stimuli were embedded pseudo-randomly in 100 fillers, of four kinds: 18 manipulating focus on a matrix or embedded verb, 24 manipulating focus on a matrix

vs. relative clause verb crossed with the presence or absence of a boundary tone, 20 manipulating focus on a matrix or embedded verb crossed with the matrix or embedded subject, and 38 unstructured filler items.⁵

Subjects' responses to comprehension questions were recorded and coded both for the interpretation under which their response was correct (short-distance vs. long-distance) and the polarity of their answer (*yes* vs. *no*), to control for possible *yes*-bias. Factor-coded question responses were analyzed by logistic mixed effect regression in the R statistical software for the three factors *location of accent* (*high* vs. *low*) *presence vs. absence of complementizer*, and *polarity of answer*, with random intercepts for subject and item and a random slope term by subject for the interaction of the two experimental factors.⁶

4.2.2.3. Results. There was an overall bias towards the downstairs interpretation across all conditions, with no more than 22% upstairs responses in any condition (194). This is consistent with Carlson (2002)'s finding that larger stretches of gapped material induce a processing cost. Accenting the second subject yielded more downstairs interpretations than accenting the first subject ($\beta = -1.5380$, $SE = 0.5386$, $z = -2.856$, $p = 0.00430$). Conditions with *that* yielded fewer downstairs interpretations than those without ($\beta = -1.5380$, $SE = 0.5386$, $z = -2.856$, $p = 0.00430$). There was also a significant interaction between these effects ($\beta = 1.5380$, $SE = 0.6525$, $z = 2.357$, $p = 0.01841$).

Percent Long-distance Responses		
	+ <i>that</i>	- <i>that</i>
(194) Matrix Accent	19%	22%
Embedded Accent	20%	9%

Post-hoc pairwise comparisons revealed that these effects were driven by the differences between the two non-*that* conditions ($p = 0.0044$) and between the *that* and non-*that* conditions with stress on the second subject ($p = 0.0270$). The presence of *that* reduced the rate of downstairs interpretations vs. conditions with stress on the upstairs subject. That is, upstairs readings were less dispreferred in the presence of *that*, contrary to the predictions of any theory in which Gapping cannot, or is more acceptable if it does not, delete a complementizer.

⁵Note that the filler stimuli used in this experiment were accompanied by either comprehension truth-judgment questions ($n=38$) or *wh*-questions ($n=62$), while the experimental stimuli were accompanied by simple polar questions.

⁶The model thus had the form: $lmer(response \sim comp*acc*pol + (1 | subject) + (1 | item) + (0 + comp*acc | item), family = "binomial")$, where *comp* is the complementizer manipulation, *acc* is the accent placement manipulation, and *pol* is the response polarity.

4.2.2.4. Discussion. These results strongly suggest that (A) long-distance gapping readings are available, though dispreferred; (B) comprehenders are sensitive to accent placement when parsing an ambiguous gapping sentence; and (C) long-distance gapping is compatible with a complementizer in the missing portion of the gapped clause.

Considering only the leftmost two columns of the figure above, it is not surprising that focal stress prosody on the second, lower subject increased the proportion of downstairs responses relative to focal stress prosody on the first, upper subject. The need for Gapping remnants to stand in a contrastive relation to their correlates is widely attested, and prosodic cueing of the contrast relation is the most likely explanation for this difference. What is surprising is that, in regard to the two conditions with focus on the lower subject, the presence of complementizer *that* in the potential long antecedent *increased*, rather than decreasing, the proportion of upstairs, long-distance responses relative to the absence of complementizer *that*. This pattern is exactly the opposite of what we would predict on the basis of accounts like Wyngærd (1993) or Johnson (2003), on which the Gapped material would have to undergo long-scrambling across a tensed clause boundary, rendering long-distance Gapping readings with an intervening tensed clause boundary unacceptable.⁷

A possible explanation for this pattern is as follows. If Gapping is derived by deletion of the missing material, at least the right Gapping remnant must evacuate the Gapped portion of the clause in order for the deleted string to form a constituent. In the short-distance Gapping reading, if the coordination of the Gapped and antecedent clauses under the matrix clause is CP-level coordination rather than TP-level coordination, the left Gapping remnant must do so also, provided the identity relation between the Gapped and antecedent clause is strict enough to require an overt COMP in the Gapped clause if one is present in the antecedent clause. Then in the short-distance Gapping reading with an overt COMP *that*, the left Gapping remnant will leave behind a COMP-trace configuration in the Gap site (195). No such violation is present in the long-distance reading (196). (Pesetsky, 1982) reports that Gapping is sensitive to COMP-trace violations, though the ability of subjects in this experiment to accept short-distance Gapping readings that involve deletion of a COMP-trace violation suggests that this sensitivity may not be absolute, at least for the grammars of the subject population in question.⁸

⁷Depending on the details of the account, the presence of *that* may be either decisive in the unacceptability of Gapping across a tensed clause boundary or merely the cause of further degradation; on no account should it *improve* long-distance Gapping.

⁸On an account of the COMP-trace effect like that in Pesetsky & Torrego (2001) under which this effect arises because of competition between a subject NP and T itself to satisfy a closest-move constraint, the sensitivity of participants to the presence

- (195) The warden supposes that the florists drive a pickup truck and the editor₁ ~~that t₁ drives~~ a midsize sedan.
- (196) The warden supposes that the florists drive a pickup truck and the editor ~~supposes that the florists drive~~ a midsize sedan.

If subjects are sensitive to this violation, they may prefer the short-distance Gapping reading less in the presence of an overt COMP. The position of the right remnant is unclear on this account, but as long as its movement outside the deletion site is not Scrambling, its ability to cross a tensed clause boundary is unexceptional.

4.2.3. General Discussion

Positive evidence that comprehenders are able to access long-distance Gapping reading under laboratory conditions was found in the auditory-presentation forced-choice experiment. I was found that manipulating whether the long-distance or short-distance Gapping reading was supported by contrastive focus prosody in the antecedent affected subjects' rate of long-distance response in the way expected if Gapping strongly prefers its correlates to be focused. Furthermore, it was found that the presence of a complementizer before the embedded clause in the antecedent of a potential long-distance Gapping construction reduced the rate of short-distance Gapping responses relative to equivalently focused sentences, such that focal stress on the lower potential correlate subject did not induce increased short-distance responses in the presence of a complementizer. This last finding may be attributable to the existence of an unpronounced COMP-trace configuration in the elided portion of the short distance, but not the long-distance, Gapping reading in these examples.

4.3. Gapping and agreement

Gapping's interaction with agreement provides an ideal environment to test a number of related questions about the operations of the parser and its relationship to the grammar.

of *that* in the antecedent would be attributed to a lower degree of antecedent-ellipsis parallelism rather than to the presence of a COMP-trace violation in the ellipsis site, but the empirical consequences are substantially the same; see Pesetsky & Torrego (2001) for discussion.

4.3.1. Introduction

Prior research on agreement interference effects (e.g. Wagers et al. (2009)) has used primarily agreement-attraction examples, where an overt verb has two potential antecedents in the left context, one of which is grammatically accessible and the other not. The trigger for retrieval was an overt verb, and the target of retrieval—what had to be retrieved upon reaching the overt verb—was the feature structure of its subject. Thus their conclusion that antecedent retrieval proceeds by cue-based feature-matching from a content-addressable memory store may not generalize to elliptical contexts. Elliptical contexts are somewhat different, in that the trigger for retrieval is the *absence* of overt verbal material in a context where it is expected (e.g. between a subject and an object) and the target of retrieval is the feature structure of an antecedent verb. But other research (e.g. Martin & McElree (2008)) indicates that a similar content-accessible memory system may be used to retrieve the antecedent of an ellipsis site as well. If a mechanism similar to the one implicated in Wagers et al. (2009)’s attraction mismatch studies is indeed used to retrieve the content of *missing* verbal material, finding similar agreement-sensitivity effects in the context of ellipsis would indicate that the representation the parser attempts to produce for the elided material is a morphosyntactic representation rather than a purely semantic one. That is, such a finding would indicate that the target of retrieval in this elliptical context is the memory representation of the antecedent verbal constituent including its agreement features, and not merely the grammatically relevant subset of the feature structure of that constituent containing semantic and argument-structure-related features.

A cue-based parsing account predicts that agreement information may be utilized in Gapping resolution even though it is neither grammatically relevant nor present in the input string, depending upon how sensitive the retrieval mechanism is, and on the manner in which it is sensitive, to grammatical constraints. On the one hand, a truly grammar-insensitive parser might be content with producing a parse in which antecedent and elliptical material stand in a lower degree of correspondence than the grammar mandates. But another possible way in which the parser could ‘fail to respect’ the grammar is in attempting to establish a higher degree of correspondence than the grammar mandates. If the parser does not depart from grammatical constraints in this second way, we might expect it to search for an antecedent for the Gapped verb using only grammatically relevant features (e.g. the verb’s voice, its argument-structure compatibility with the gapping

remnants, and in certain contexts possibly its tense). On the other hand, if it does depart in this way, and if sensitivity to agreement information is a property of the parsing mechanism in general (and not merely of the parser when processing a configuration in which agreement is grammatically relevant) we might expect all retrieval cues to be deployed. Furthermore, if similarity-based interference effects are detected, such that the parser experiences difficulty (as indexed by longer reading times) in the presence of two feature-matching candidate antecedents, this will be a clear signal of a cue-based retrieval system, such that featurally similar candidates stored alongside one another in memory impede the retrieval process (for discussion of this point, see Lewis & Vasishth (2005b)). Non cue-based models do not predict that difficulty effects should be observed in the presence of featurally-similar candidate antecedents, since on structure-based account of antecedent retrieval agreement features should serve at most as a check on whether retrieval has been accomplished successfully, and should not lead to competition among candidate antecedents because these candidates will not be compared in parallel.

These experiments seek to investigate (i) whether the parser is sensitive to agreement information when retrieving the elided content of a Gapping configuration and (ii) if so, whether and how this interacts with the parser's sensitivity to structural constraints. Sensitivity of the parser to ϕ -features is not mandated by the grammar in the context, since Gapping in English is agreement-insensitive. If the parser is sensitive to grammatically irrelevant agreement information, this would support a cue-based account on which the parser attempts to retrieve a morphosyntactic representation (rather than just a semantic or pragmatic one) for the elided material. If it is also sensitive, either simultaneously or later, to grammatically relevant structural constraints, this would indicate that these structural constraints either constrain the antecedent retrieval mechanism, or filter its output, depending on the timecourse observed.

The retrieval of the missing material in a Gapping construction appears to be somewhat different from in related constructions like Verb Phrase Ellipsis (VPE). In particular, the size and complexity of the material to be recovered does not appear to impact retrieval times in VPE (Martin & McElree, 2008). In contrast to this, in Gapping constructions with topicalized remnants, which are hypothesized to force a parse involving more missing material than need be present in equivalent examples with non-topicalized remnants, Carlson (2002) found a dispreference for larger more complex antecedents. On the one hand, this size-sensitivity is theoretically somewhat puzzling. On the other hand, it is experimentally useful since it allows the size of the

retrieved elided material to be diagnosed, as I propose to do here, to test whether retrieval of the elided verbal material's antecedent is sensitive to structural constraints on 'long-distance Gapping' as discussed below.

4.3.2. Number

This experiment seeks to investigate whether the parser is sensitive to agreement information when retrieving the elided content of a Gapping configuration. If the parser is sensitive to (usually) grammatically irrelevant agreement information, this would support a cue-based account on which the parser attempts to retrieve a morphosyntactic representation (rather than just a semantic or pragmatic one) for the elided material. Moreover, if antecedent competition effects are found, such that retrieval is more costly/time-consuming in the presence of an agreement-matching competitor antecedent, this would constitute a clear signal of a cue-based retrieval system. While the results observed are not perfectly clean, they do give evidence of antecedent competition effects, indicating strongly that a cue-based system is being used to retrieve among the candidate Gapping antecedents.

4.3.2.1. Design and Materials. Number is the most straightforward ϕ -feature to investigate in a long- vs. short-distance Gapping paradigm because, unlike gender, it is reflected in English's verbal morphology and, unlike person, it can be cross-varied between the two subjects (=potential left Gapping correlates) without producing any substantial implausibilities.

The basic design of the experiment is straightforward. Ambiguously long/short-distance Gapping sentences contain two subjects apart from the subject of the Gapped clause, which can serve as potential correlates for the remnant subject of the Gapped clause. By varying which of these subjects matches the number specification of the remnant subject of the Gapped clause, it is possible to indirectly vary whether the long-distance reading, the short-distance reading, both, or neither, would allow the parser to recover a morphosyntactically matched antecedent for verb in the Gapped clause. If both potential correlates control the same verb form as the remnant subject of the Gapped clause, both should be equally plausible retrieval candidates, modulo the observed preference for short-distance Gapping. If only one potential correlate subject matches the remnant Gapped clause subject, this should bias the parser's retrieval mechanism toward the parse in which this potential correlate is the actual correlate, and cause a slowdown effect if the matched

subject is the more distant subject which involves the more difficult long-distance parse. Thus we can indirectly investigate whether the parser is attempting to recover a morphosyntactic representation for the missing verbal material in the Gapped clause by varying the agreement match of the two potential correlate subjects.

If the parser is sensitive to agreement when recovering the Gapped verb, the disambiguation region may exhibit a slowdown effect in conditions where the agreement on the closest antecedent does not match what would be expected on the Gapped verb, as well as exhibiting more regressions to the more distant but agreement-matching antecedent and, correspondingly, fewer to the closer, mismatched verb. If the parser's antecedent retrieval is *insensitive* to agreement, these effects are not predicted.

These items cross-vary the number of the matrix antecedent (*suppose(s)*) and the more local antecedent (*swim(s)*) so that regressions to each potential antecedent can be directly compared. In the examples in question, all subjects were semantically unrelated occupation nouns and all matrix verbs were sentential-complement taking propositional attitude verbs (see Appendix for stimuli list), with half of the embedded verbs taking NP complements and half taking PP complements.

- (197) a. The general supposes the janitor swims at the gym and the writer at the beach ...
 b. The generals suppose the janitor swims at the gym and the writer at the beach ...
 c. The general supposes the janitors swim at the gym and the writer at the beach ...
 d. The generals suppose the janitors swim at the gym and the writer at the beach ...

A slowdown effect is predicted in the (c,d) conditions where the preference for short-distance Gapping readings conflicts with the retrieval mechanism's hypothesized preference for an isomorphic antecedent. This effect may be more pronounced in the (c) condition where, besides the closer antecedent being mismatched, there is a (linearly and structurally) more distant antecedent that does match in agreement features, which may lead to competition in retrieval, a signature effect of cue-based retrieval models.

4.3.2.2. Procedure. 41 native speakers of English at Northwestern University read 16 sentences like (197) (see Appendix for stimuli list) while their eye-movements were recorded. The sentences were pseudo-randomly distributed among 96 filler sentences drawn from other experiments not reported here, of four different types: 24 with *why*-sluicing varying complex vs. simple antecedents, 24 with embedded questions varying gender

match of a reflexive, 24 with simple Gapping examples varying the entailment relation between the predicates denoted by the right Gapping remnants, and 24 containing long-distance *wh*-extractions varying gender match between a reflexive and its antecedent. While 24 of the fillers contained Gapping, these were considerably simpler than the experimental items, and no fillers contained number manipulations.

The resulting data was manually corrected for vertical drift and to remove blinks, and was analyzed using mixed-effect linear regressions, with model comparison to derive p-values. Analysis was conducted using the R statistical software by comparing maximally specified linear mixed effects regressions models (*lmers*) with comparison models which have an effect of interest removed. β -values and standard errors were calculated on the basis of the maximal model.⁹ Maximal models consisted of the two experimental manipulations *upper subject agreement match/mismatch* and *lower subject agreement match/mismatch* (with levels contrast coded as 0.5 and -0.5 to sum to 0), a presentation order term, and random slopes and intercepts for the interaction of the two fixed effects, plus the presentation order, by subject and item.¹⁰ Model comparison using ANOVA was used to derive p-values and χ^2 values.

First-fixation times, first-pass times, and regression path durations were analyzed at the right Gapping remnant region (in (197), *at the beach*), and a spillover region after the right Gapping remnant region. Re-reading times were analyzed at the position of the matrix subject+verb (in (197), *The general(s) suppose(s)*) and the embedded subject+verb (in (197), *the janitor(s) swim(s)*). Because the subject+verb pairs sometimes differed in character length between conditions, reading times for these region were residualized by character length.

4.3.2.3. Results. At the position of the upper potential antecedent subject, there was a significant interaction in residualized re-reading times between the number match/mis-match of the upper subject and the number match/mismatch of the lower subject ($\beta = 483.343$, $SE = 137.644$; χ^2 from ANOVA model comparison = 12.226 (df=1), $p = 0.0004713$), such that the match/match condition yielded the longest reading times (4.2). No main effects were significant. This interaction appears to be a classic antecedent competition effect: more difficulty in retrieval in the presence of a feature-matched competitor.

⁹When the maximal model did not converge, its random effects structure was simplified by removing interactions and order parameters from the random slopes until convergence was reached, and reduced models were simplified correspondingly.

¹⁰The maximal model (before potential simplification to yield convergence) is as follows: $lmer(rt \sim us*ls + order + (1 + us*ls + order | subject) + (1 + us*ls + order | item))$, where *rt* is the reading-time measure, *us* is the agreement manipulation of the upper subject, and *ls* is the agreement manipulation of the lower subject.

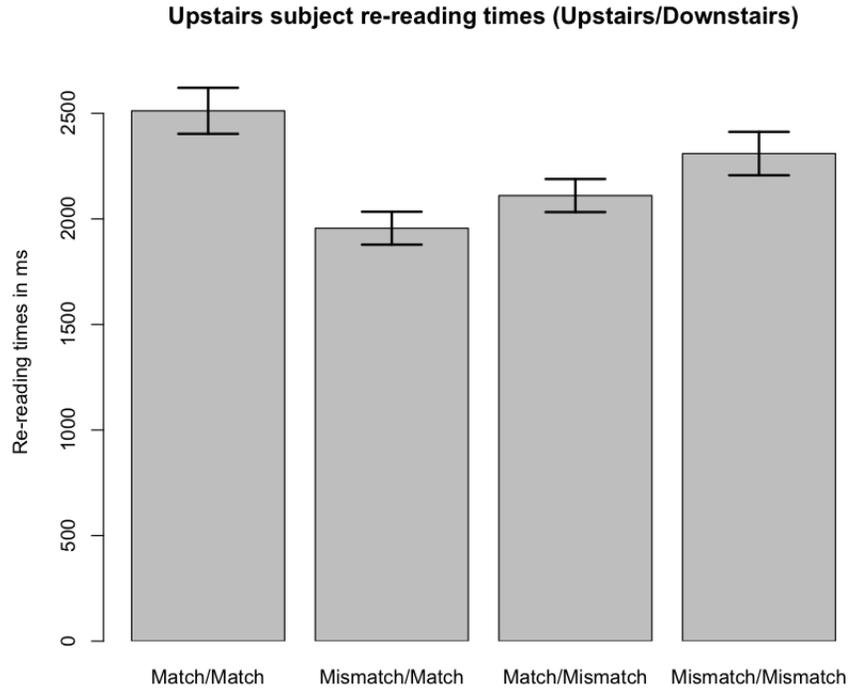


Figure 4.2.

At the disambiguation region (the right Gapping remnant), where the parser has enough bottom-up evidence to determine that it has encountered a Gapping construction, there was a significant effect in first-pass reading times of the match/mismatch of the lower subject ($\beta = 47.85090$, $SE = 16.58420$; χ^2 from ANOVA model comparison = 6.7198 (df=1), $p = 0.009535$), as shown in figure (4.3).

4.3.2.4. Discussion. The pattern of antecedent re-reading times is broadly consistent with cue-based, feature-matching models of antecedent retrieval. In particular, the longer re-reading times on the upper candidate antecedent in the match/match condition is most plausibly a competition effect: the two featurally-similar antecedents compete with one another in the retrieval process, leading to greater confusibility and thus more time spent re-reading the potential antecedents.

The longer first pass times found in the disambiguation region when the closer potential antecedent was mismatched are not particularly surprising (they are a fairly straightforward recency effect), but they do have a number of possible interpretations. They may be straightforwardly attributable to memory decay, a factor which more sophisticated versions of the cue-based class of retrieval models incorporate. Another possibility

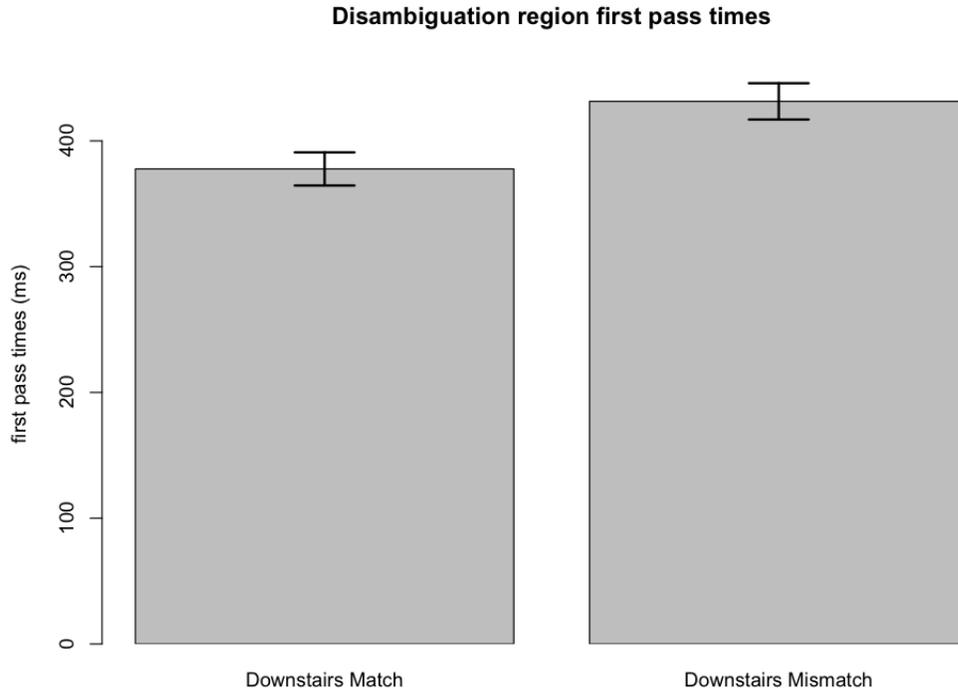


Figure 4.3.

is that they may indicate a role for a properly search-like process involved in antecedent retrieval, or be an index of real-time structure building occurring in the Gapped clause of unpronounced material corresponding to the structurally larger antecedent.

Overall, the results of this first experiment support a cue-based feature-matching retrieval system as the mechanism underlying Gapping antecedent retrieval, and serve to demonstrate that grammatically irrelevant ϕ -feature mismatch impacts retrieval times in Gapping. The studies that follow investigate whether this pattern of behavior extends to other ϕ -features than number and whether it interacts with syntactic preferences in real time.

4.3.3. Person

This experiment is a follow-up to that reported in section (4.3.2) that varies the feature of person instead of number.

4.3.3.1. Design and Materials. The ϕ -feature of person is somewhat less straightforward to investigate than that of number, but has some compensating advantages as well. The most immediate difficulty for the present long/short-Gapping paradigm comes from the fact that it is difficult to cross-vary the person of the two potential antecedents while still producing plausible sentences. Including one non-third-person subject, or none, is not problematic, but if both the matrix and embedded subject are in the same non-third person, the choice of possible embedding predicates is quite limited: examples like *You suppose that you swim at the gym ...* may be treated strangely because the circumstance they describe is bizarre.

However, a more plausible example can be constructed by using both of the non-third-person forms as the two potential correlate subjects: *I suppose that you swim at the gym ...* or *You suppose that I swim at the gym ...*, for instance.

Materials consisted of sets of sentences like the following, with a single all-third-person condition and three pairs of conditions (b,c), (d,e), and (f,g) that alternate placement of non-third-person DPs. In (198b,c) the matrix subject is non-third person (i.e. mismatched with the Gapped subject), in (198d,e) the embedded subject is non-third person, and in (198f,g) both candidate antecedent subjects are non-third person. The subject of the Gapped conjunct is always third-person. The verbs and their complements are as in (197) from the previously reported experiment, but the spillover regions are slightly modified for plausibility reasons (see Appendix for stimuli list). This design was originally intended to investigate differences between the non-third persons in their degree of retrieval interference but, after data collection was completed, it was realized that the mode of data collection employed (with each subject seeing only either the first or second half of the conditions in (198) for presentation-software reasons) would not support such an analysis, and so in the analysis below the pairs of conditions (b,c), (d,e), and (f,g) are collapsed, obviating the difference between first- and second-person candidate antecedents. This experimental error is unfortunate in that it does not allow us to distinguish the relative mismatch effects of first- vs. second-person candidate antecedent subjects, but it does not impede the experiment's ability to investigate person-mismatch in Gapping overall.

- (198) a. Carol supposes Laura swims at the gym and Denise at the beach ...
- b. I suppose Laura swims at the gym and Denise at the beach ...
- c. You suppose Laura swims at the gym and Denise at the beach ...

- d. Carol supposes I swim at the gym and Denise at the beach ...
- e. Carol supposes you swim at the gym and Denise at the beach ...
- f. You suppose I swim at the gym and Denise at the beach ...
- g. I suppose you swim at the gym and Denise at the beach ...

A slowdown effect is predicted in conditions (198d-g) where the preference for short-distance Gapping readings conflicts with the retrieval mechanism's hypothesized preference for an isomorphic antecedent. This effect may be more pronounced in the (198d,e) conditions where, besides the closer antecedent being mismatched, there is a (linearly and structurally) more distant antecedent that does match in agreement features, which may lead to competition in retrieval.

4.3.3.2. Procedure. 41 native English speakers at Northwestern read 16 sentences like (??) (see Appendix for stimuli list) while their eye movements were tracked. Half of subjects saw the first 3 conditions (with the [a] condition occurring twice as frequently) and half of subject saw the last 4 conditions. The sentences were pseudo-randomly distributed among filler sentences drawn from other experiments not reported here. For the first half of subjects, there were 152 fillers of five different types: 24 with biclausal Garden-Path like *wh*-dependencies varying gender match with a reflexive, 24 with relative clauses containing or not containing reflexives pronouns, 48 varying presence/absence of backward sluicing with an animacy manipulation, 24 containing Garden Path-like ambiguous clause boundaries varying gender match of a pronoun with Condition C contexts such that the pronoun was either a possessor or a subject, and 32 containing nested relative clauses varying an animacy manipulation. For the second half of subjects, there were 212 fillers of seven different types: 24 with embedded *wh*-questions crossed with a gender manipulation, 24 with simple Gapping examples varying the entailment relation between the predicates denoted by the right Gapping remnants, 36 manipulating parallelism between short- vs. long-distance pronoun co-reference in coordinated clauses, 48 varying presence/absence of backward sluicing with an animacy manipulation, 24 containing Garden Path-like ambiguous clause boundaries varying gender match of a pronoun with Condition C contexts such that the pronoun was either a possessor or a subject, 32 containing nested relative clauses varying an animacy manipulation, and 24 containing embedded interrogative clauses crossing pied-piping vs. P-stranding vs. an

interrogative complementizer. While 24 of the fillers for the second half of subjects contained Gapping, these were considerably simpler than the experimental items, and no fillers contained person manipulations.

The resulting data was manually corrected for vertical drift and to remove blinks, and was analyzed using mixed-effect linear regressions, with model comparison to derive p-values. Analysis was conducted using the R statistical software by comparing maximally specified linear mixed effects regressions models (*lmers*) with comparison models which have an effect of interest removed. β -values and standard errors were calculated on the basis of the maximal model.¹¹ Maximal models consisted of the two experimental manipulations *upper subject agreement match/mismatch* and *lower subject agreement match/mismatch* (with levels contrast coded as 0.5 and -0.5 to sum to 0), a presentation order term, and random slopes and intercepts for the interaction of the two fixed effects, plus the presentation order, by subject and item.¹² Model comparison using ANOVA was used to derive p-values and χ^2 values.

First-fixation times, first-pass times, and regression path durations were analyzed at the right Gapping remnant region, and a spillover region after the right Gapping remnant region. Re-reading times were analyzed at the position of the matrix subject and the embedded subject; because these regions differed in character length between conditions, reading times for these regions were residualized by character length.

4.3.3.3. Results. First, at the position of the second Gapping remnant (*at the beach* in 198 above), a main effect is observed of the match/mismatch of the closer, downstairs potential antecedent subject for both first-pass times ($\beta = -233.3700$, $SE = 66.5493$; χ^2 from ANOVA model comparison = 10.607 (df=1), $p = 0.001126$) and regression path durations ($\beta = 443.9391$, $SE = 135.1821$; χ^2 from ANOVA model comparison = 11.048 (df=1), $p = 0.0008878$). However, the direction of the effect is reversed between the earlier (first-pass) and later (regression-path) measurements. In first pass times (4.4), the second Gapping remnant is read more slowly when the lower candidate antecedent matches the Gapped conjunct's person specification, while in regression-path durations (4.5), it is read more slowly.

¹¹When the maximal model did not converge, its random effects structure was simplified by removing interactions and order parameters from the random slopes until convergence was reached, and reduced models were simplified correspondingly.

¹²The maximal model (before potential simplification to yield convergence) is as follows: $lmer(rt \sim us*ls + order + (1 + us*ls + order | subject) + (1 + us*ls + order | item))$, where *rt* is the reading-time measure, *us* is the agreement manipulation of the upper subject, and *ls* is the agreement manipulation of the lower subject.

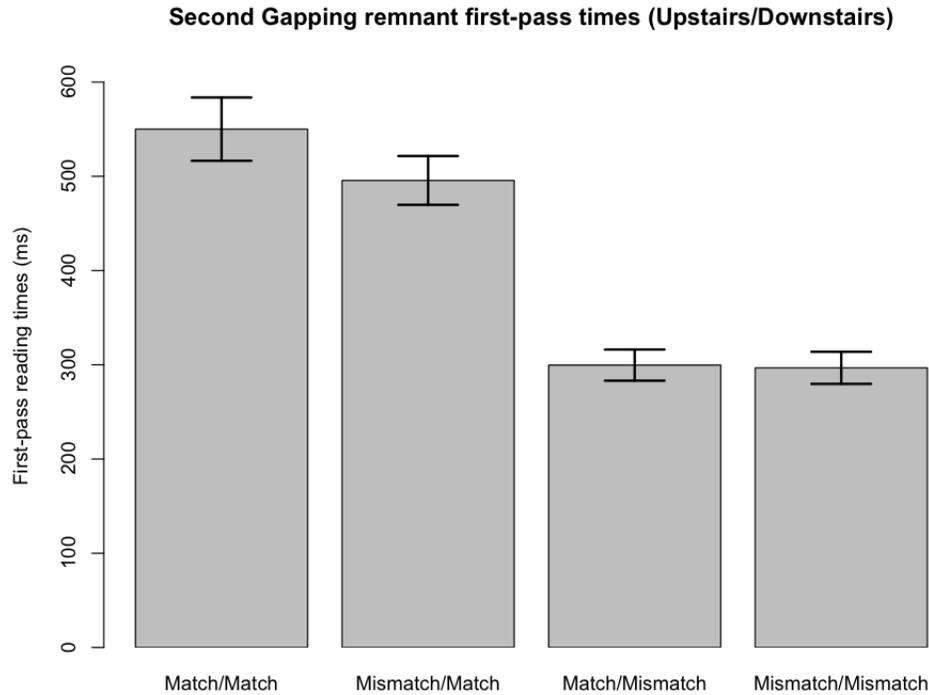


Figure 4.4.

The regression-path durations at this region show a pattern consistent with an initial short-distance Gapping parse conflicting with a feature-matching preference. But in contrast, first-pass times at this region show the reverse pattern, with mismatched conditions being read substantially faster.

At the spillover region after the right Gapping remnant, a different pattern is found. There is a main effect of the gender match of the closer, downstairs candidate antecedent on reading time measures in first-pass times ($\beta = -233.3700$, $SE = 66.5493$; χ^2 from ANOVA model comparison = 26.126 (df=1), $p = 3.199e-07$), such that the matched conditions are read faster than the mismatched conditions (4.6).

Finally, regression-path durations do not show an effect of the match/mismatch of the closer, downstairs candidate antecedent subject, but do show an effect of the match/mismatch of the more distant, upstairs candidate antecedent subject ($\beta = 405.4750$, $SE = 194.6413$; χ^2 from ANOVA model comparison = 7.1271 (df=1), $p = 0.007593$). The pattern is such that upstairs-mismatched conditions are read more slowly than upstairs-matched conditions (4.7).

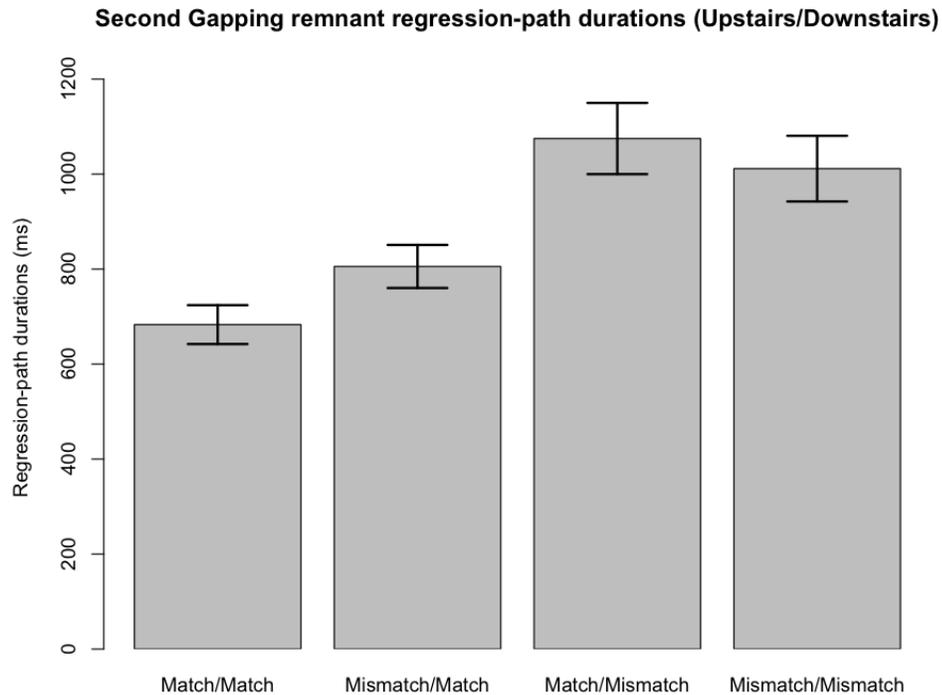


Figure 4.5.

The late timing of this effect is consistent with the parser only evaluating the long-distance Gapping reading in later stages of processing, after having already considered the preferred short-distance reading. The absence of an interaction may indicate that the long-distance parse is considered by the parser, albeit belatedly, even when the short-distance parse satisfied all the parser's preferences (viz. for a short-distance Gapping reading with feature-matched subjects).

4.3.3.4. Discussion. Unlike in the previous experiment, in this experiment no interactions between the upper and lower subjects' match/mismatch with the Gapped conjunct were observed. This experiment therefore cannot adjudicate between different models of antecedent retrieval, but it does provide evidence for the use of Person features in the antecedent retrieval of Gapping constructions. The fact that an effect of the upstairs subject was observed only in very late measures (spillover regression-path durations) while effects of the downstairs subject occurred in earlier regions for earlier measures is consistent with the observed preference for short-distance Gapping interpretations, and is thus entirely consistent with a structure-based search mechanism that considers closer candidate antecedents first.

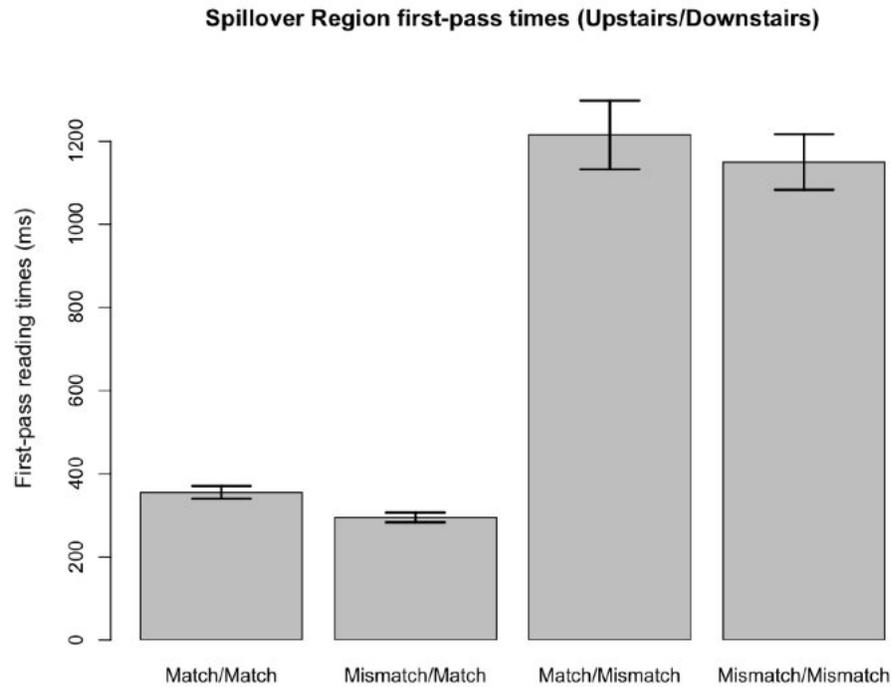


Figure 4.6.

4.3.4. Gapping, agreement, and COMP

4.3.4.1. Introduction. This experiment aims to test whether and how the parser's sensitivity to agreement information in the antecedent retrieval of long-distance Gapping constructions interacts with structural constraints. The other experiments discussed in this section have provided evidence that the parser is sensitive to the morphosyntactic features of the missing material in Gapping constructions. If it is also sensitive, either simultaneously or later, to grammatically relevant structural constraints, this would indicate that these structural constraints either constrain the antecedent retrieval mechanism, or filter its output, depending on the timecourse observed. In this experiment, we find evidence for agreement-sensitivity in the parser's antecedent retrieval of Gapping antecedents, corroborating the results of the experiments described above. We find only marginal evidence, however, of on-line sensitivity to structural preferences interacting with this agreement-sensitivity, suggesting that retrieval of Gapping antecedents may not be sensitive to structural cues.

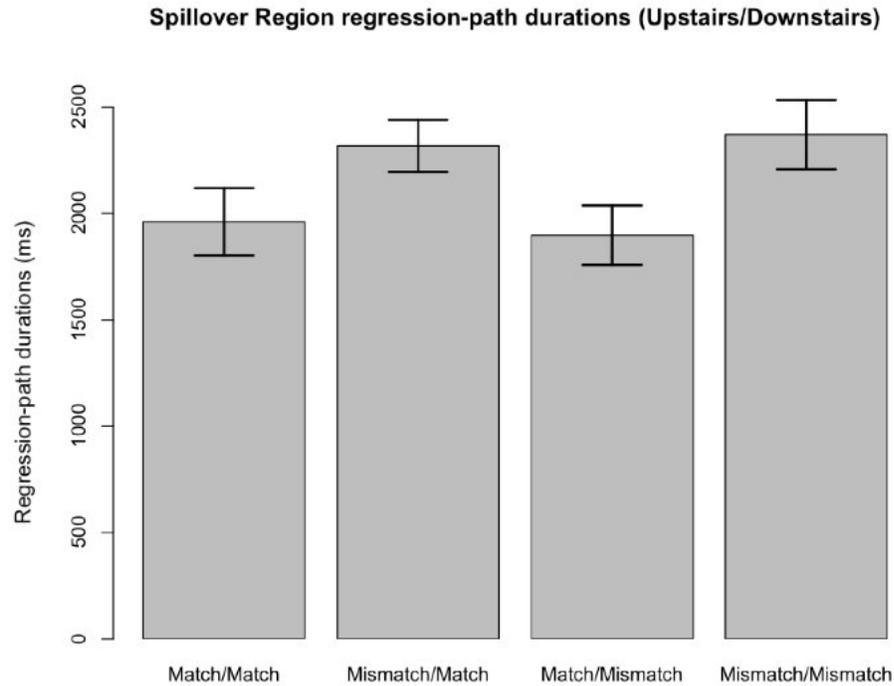


Figure 4.7.

4.3.4.2. Design & Materials. Sentences are as in (199), with both the agreement match of the embedded subject and the presence/absence of a complementizer introducing the embedded clause cross-varied for a two-by-two design. The sentence in (199) consist of a complex antecedent clause containing a matrix subject plus a sentential-complement-taking propositional attitude verb (*Carolyn remembers* in 199) and an embedded clause containing an embedded subject, an embedded verb, and the verb's complement (*Rebecca/you drink/drinks gin* in 199). These regions together constitute the candidate antecedents for the Gapping construction tested. Following the candidate antecedent regions is the coordinator *and* and a Gapped clause (*Catherine vodka* in 199), followed in turn by a spillover region (not shown in 199).

- (199) a. Carolyn remembers Rebecca drinks gin and Catherine vodka ...
 b. Carolyn remembers you drink gin and Catherine vodka ...
 c. Carolyn remembers that Rebecca drinks gin and Catherine vodka ...
 d. Carolyn remembers that you drink gin and Catherine vodka ...

If the parser is sensitive (above and beyond the grammar’s requirements, but consistent with a cue-based account) to agreement when recovering the Gapped verb, the region in which the Gapping configuration becomes apparent (henceforth ‘disambiguation region’) may exhibit a slowdown effect in the mismatch conditions (b,d) where the agreement on the closest antecedent does not match what would be expected on the Gapped verb (*drink/drinks*), as well as exhibiting more regressions to the more distant but agreement-matching antecedent (*remembers*). If the parser’s antecedent recovery is *insensitive* to agreement, these effects are not predicted. (Based on the results of the experiments above, we expect the former prediction, of agreement-sensitivity, to obtain.)

However, if the parser’s antecedent retrieval is *also* sensitive to a structural constraint regarding the interaction of long-distance Gapping with a complementizer, the picture may be more complicated. If the reported unacceptability of long-distance Gapping in these contexts is genuine (i.e. if the result of the experiments described in section 4.2 is spurious), then either or both of the above effects will be mitigated or absent in the presence of the complementizer, when the long-distance reading is excluded (condition d). If both slowdown and regression effects are mitigated in the (d) condition, this would indicate that the retrieval mechanism is sensitive to structural constraints, considering some candidate antecedents and not, or more than, others. If only the regression effect is mitigated, this would indicate that the retrieval process is not sensitive to the relevant structural constraint, but that later processes, perhaps those of structure-building and integration, are.

On the other hand, if the result of the experiment in (4.2) is generalizable to on-line measures, a different pattern of results may be expected. In particular, if experiment (4.2) legitimately indicates that in the presence of an overt complementizer the long-distance Gapping reading is *less* dispreferred, it should be instead expected that the slowdown and/or regression effects in the agreement-mismatch conditions (b,d) will be mitigated in the condition in which the complementizer is absent, viz. (b).

To reiterate then, the intention of this experiment is to test whether the parser’s antecedent retrieval mechanism is sensitive to features that are neither grammatically relevant nor overtly present and, if so, whether and how this sensitivity interacts with sensitivity to structural constraints.

4.3.4.3. Procedure. 36 native English speakers at Northwestern read 16 sentences like (199) (see Appendix for stimuli list) while their eye movements were tracked. The sentences were pseudo-randomly distributed

among 148 filler sentences drawn from other experiments not reported here, of six different types: 24 with potential Garden Path relative clauses varying the grammatical gender match of a reflexive with its antecedent, 24 *how many* questions varying subject number with presence or absence of quantifier *each*, 28 containing embedded relative clauses varying gender match of a pronoun with Condition C contexts such that the pronoun was either a possessor or a subject, 24 containing Garden Path-like ambiguous clause boundaries varying gender match of a pronoun with Condition C contexts such that the pronoun was either a possessor or a subject, 24 with potential Garden Path relative clauses varying the stereotypical gender match of a reflexive with its antecedent, and 24 containing long-distance *wh*-extractions varying gender match between a reflexive and its antecedent. No fillers contained Gapping, complementizer manipulations, or verbal agreement manipulations.

The resulting data was manually corrected for vertical drift and to remove blinks, and was analyzed using mixed-effect linear regressions, with model comparison to derive p-values. Analysis was conducted using the R statistical software by comparing maximally specified linear mixed effects regressions models (*lmers*) with comparison models which have an effect of interest removed. β -values and standard errors were calculated on the basis of the maximal model.¹³ Maximal models consisted of the two experimental manipulations *presence/absence of complementizer* and *agreement match/mismatch* (with levels contrast coded as 0.5 and -0.5 to sum to 0), a presentation order term, and random slopes and intercepts for the interaction of the two fixed effects, plus the presentation order, by subject and item.¹⁴ Model comparison using ANOVA was used to derive p-values and χ^2 values.

First-fixation times, first-pass times, and regression path durations were analyzed at the right Gapping remnant region (in (199), *gin*), and a spillover region after the right Gapping remnant region. Re-reading times were analyzed at the position of the matrix subject+verb (in (199), *Carolyn thinks*) and the embedded subject+verb (in (199), *Rebecca/you drinks/drink*); because the embedded subject+verb region differed in character length between conditions, reading times for this region were residualized by character length.

¹³When the maximal model did not converge, its random effects structure was simplified by removing interactions and order parameters from the random slopes until convergence was reached, and reduced models were simplified correspondingly.

¹⁴The maximal model (before potential simplification to yield convergence) is as follows: $lmer(rt \sim mm*comp + order + (1 + mm*comp + order | subject) + (1 + mm*comp + order | item))$, where *rt* is the reading-time measure, *mm* is the agreement manipulation factor, and *comp* is the complementizer manipulation factor.

4.3.4.4. Results. Longer first-pass reading times were found at the spillover region immediately after the Gapping remnants in mismatched conditions ($\beta = -165.6911$, $SE = 76.0221$; χ^2 from ANOVA model comparison = 4.3056 (df=1), $p = 0.03799$), as shown in figure 4.9.

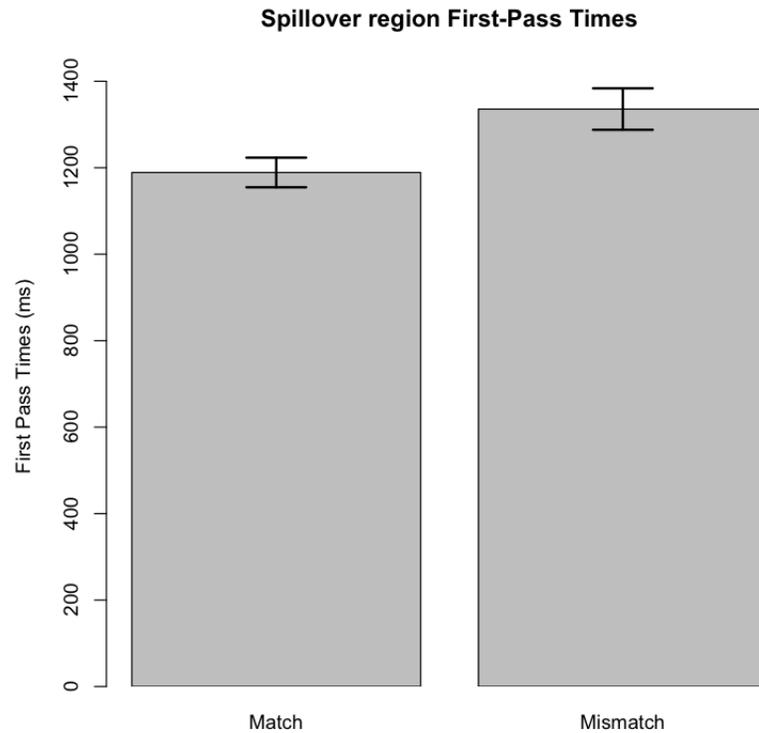


Figure 4.8.

At the position of the embedded clause antecedent, shorter re-reading times (figure ??) were found in the mismatch conditions ($\beta = 317.8199$, $SE = 78.4586$; χ^2 from ANOVA model comparison = 11.631 (df=1), $p = 0.0006485$).

No other significant effects were found.

4.3.4.5. Discussion. Agreement mismatch between the embedded, short-distance Gapping antecedent and the Gapped verb yielded longer first-pass reading times on the spillover region immediately after the right Gapping remnant and shorter re-reading times on the embedded clause antecedent itself. This pattern is consistent with the observed preference for short-distance over long-distance Gapping if the parser experiences difficulty retrieving an agreement-mismatched antecedent for its Gapping parse, and can be explained in either

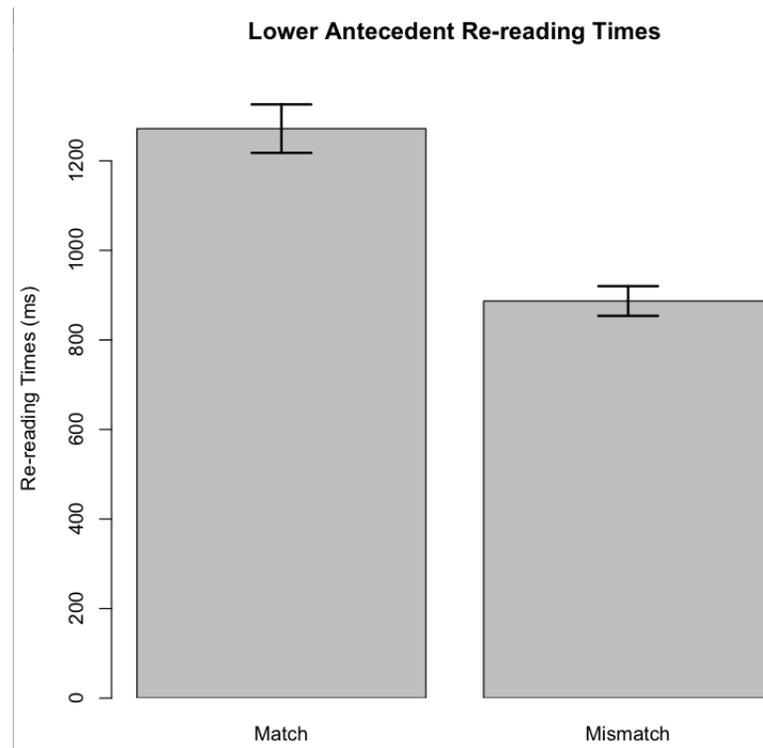


Figure 4.9.

of two ways. On the one hand, the slowdown in the spillover region could be taken to represent a difficulty effect experienced due to the parser's choosing to adopt a dispreferred, more complex long-distance Gapping parse due to automatic feature-matching processed choosing the long-distance Gapping reading, at least initially. On this account, the shorter embedded antecedent re-reading times in the mismatch conditions result from the parser simply not considering this candidate antecedent early on and thus spending less time regressing to it. On the other hand, the slowdown in the spillover region could be taken to represent a different kind of difficulty effect, in this case due to the parser positing a short-distance Gapping reading and experiencing difficulty in retrieving or integrating a feature-mismatched antecedent. On this account, however, the shorter embedded antecedent re-reading times in the mismatch conditions are somewhat mysterious. In either case, the result demonstrates agreement-sensitivity in Gapping antecedent resolution; unfortunately, the present data do not appear to be able to distinguish these two possibilities.

There were no significant effects or interactions of the complementizer manipulation, but there was a marginal interaction with a large β -value in re-reading times at the embedded clause antecedent, such that

the numerically longest RTs are found for matching subjects without COMPs ($\beta = 211.2807$, $SE = 127.3300$; χ^2 from ANOVA model comparison = 3.7677 (df=1), $p = 0.05225$). As this effect is marginal, it does not bear too much interpretation; but if a higher-powered replication of the present study were to find it to be significant, it would be consistent with the result of (4.2) to support the conclusion that, contra Wyngærd (1993), Johnson (2003), the presence of a complementizer biases the parser *toward* the long-distance Gapping reading, because a greater degree of antecedent competition would be predicted to occur in the absence of the structural cue provided by the complementizer.¹⁵ Unfortunately, that result did not reach significant in this data, and consequently can be interpreted only speculatively.

4.4. Conclusion

The studies described in this chapter have provided evidence that long-distance Gapping readings are experimentally accessible to subjects in principle, at least for certain kinds of tasks. Furthermore, they have demonstrated that at least some of the ϕ -features both candidate antecedent subjects are utilized online in the antecedent retrieval process, in a manner consistent with a cue-based retrieval system, though interaction effects indicative of a cue-based process were not found for the ϕ -feature of Person. Speculatively, the lack of antecedent competition effects observed in the Person experiment, in contrast to their fairly robust attestation in the Number experiment above, may be due to differences between the semantic correlates of these two ϕ -features: while Number expresses a property of the set of entities denoted by an NP (its cardinality), Person is inherently indexical in nature, referring (at least for non-third persons) fairly directly to entities in the discourse model, and may consequently be retrieved using a different mechanism. While no significant interaction of agreement-mismatch effects with syntactic preferences was found in study (4.3.4), the lack of an effect observed there suggests that initial antecedent retrieval is less sensitive to syntactic structure than later stages of processing, at least if the *that*-preference observed in study (4.2) has a syntactic explanation.

¹⁵Suggestively, a post-hoc pairwise t-test with Bonferroni correction finds the difference between the +COMP and -COMP agreement-matched conditions significant at $p = 0.044$, suggesting that a higher-powered study might find an interaction proper here.

CHAPTER 5

Agreement and syntactic cues in the prediction of Gapping**5.1. Gapping and θ -structure**

In contrast to ϕ -feature mismatch, θ -role mismatch between a Gapped verb and its antecedent yields unacceptability (200). The θ -role properties of a verb are reflected by its v P-internal syntax (the Uniformity of Theta-Assignment Hypothesis (*UTAH*), Baker 1988).

- (200) a. The boy loads the packages in the van and the man ~~loads the packages~~ in the truck.
 b. *The boy loads the van with packages and the man ~~loads the packages~~ in the truck.

The syntactic relations of the innermost portions of the verbal domain are disrupted by later head-movement and A'-movement; in English, by movement of V to v and of the subject to Spec,TP. Nonetheless, in order to complete θ -role assignment, any parser that respects the syntax relatively closely should be expected to build these lower domains. If the parser is presented with a string that is ambiguous between a Gapping construction and sentence containing no ellipsis, its choice of parse may be conditioned by the acceptability of the antecedent-ellipsis relation between the argument-structure-reflecting v P domain of the potential Gapped conjunct and its potential antecedent. By cross-varying the acceptability of this relation with the agreement cues shown above to be relevant for Gapping antecedent retrieval, we can investigate the interaction between the parsing of the syntax of the inner portions of the clause and the surface morphological cues to elided verb form retrieval.

5.1.1. Agreement vs. Argument-structure mismatch

This experiment seeks to investigate whether ϕ -features and θ -roles are used together to retrieve the antecedent of the missing material in the Gapped clause, or whether one pre-empts the other. On the one hand, we might expect θ -roles to pre-empt ϕ -features in retrieval, since only the former are grammatical relevant in this context. On the other hand, θ -roles are not morphologically marked in English, and may for

this reason be a less accessible cue for retrieval if more complex processes (e.g., plausibly, structure building of the *vP* domain) must occur before they can be accessed. The pattern actually found is somewhat surprising: agreement impacts reading times only in argument-structure mismatched conditions, suggesting that the parser may be sensitive to agreement match in its decision to posit a Gapping parse only once it has evidence that such a parse is unviable, perhaps as a recovery strategy similar to the one documented in Wagers et al. (2009).

5.1.1.1. Introduction. Yoshida et al. (2013) showed that Gapping parses are incrementally preferred under parallelism with a preceding context when a Gapping parse allows the parser to maximize parallelism between the left and right conjuncts and a parse with a PP modifying an NP, though also available, does not, as in (201a) (cf. Knoeferle & Crocker 2009 for the strength of the parallelism preference).¹ Unsurprisingly, they also found that a Gapping parse was not adopted when the argument structure of the potential antecedent was inappropriate for the Gapping remnants. Incorporating an agreement match/mismatch manipulation enables investigation of whether mismatched number of the subject can influence spray/load-mismatch detection.

- (201) a. ...the old lady stood near the park bench and the lawyer near the telephone pole stood with crossed arms.
- b. ...the old lady sat on the park bench and the lawyer near the telephone pole stood with crossed arms.

By using spray/load alternating verbs, which are resistant to mismatch under Gapping in acceptability judgment (note that the Gapping parse of (202c) is unacceptable), we can test the relative priority with which the parser employs θ -roles and ϕ -features in retrieval.

5.1.1.2. Design & Materials. Stimuli are as in (202), with both the agreement and the spray/load alternation cross-varied for a two-by-two design. The sentences in (202) consist of a potential antecedent clause containing a spray/load alternating verb in one of its two possible argument-structure frames; in the relevant examples, either the *with*-frame, as in *load the truck with the fruit* (conditions a and b) or the *in/on*-frame, as in *load the fruit on the truck* (conditions c and d). The subject of this first clause is varied between singular and plural across conditions, singular in conditions (b) and (d) and plural in conditions (a) and (c). The

¹This is a simplification of the Yoshida et al. paradigm, for which the interested reader should see Yoshida et al. 2013.

second clause always contains a plural subject modified by a *with*-PP, which is followed by a manner adverb; in (202), *slowly*. Because Gapping resists having three remnants, at this point the parser may realize it is not in a Gapping configuration.

If the parser is eager to posit a Gapping parse under potential parallelism with a candidate antecedent clause, as Yoshida et al.'s result suggests, the *with*-PP in the second clause should cause it to do so when the preceding clause's verb is in the *with*-frame (conditions a and b). By additionally varying whether the stimuli have agreement-matching subjects (conditions a and c), we can investigate whether agreement-parallelism is relevant for the parser's calculation of antecedent-ellipsis parallelism and consequent decision to consider a Gapping parse.

Yoshida, Carlson & Dickey (2013) showed that Gapping parses are incrementally preferred under parallelism with a preceding context where either a Gapping parse or a parse with a PP modifying an NP is available, as in (202a), but that a Gapping parse was not adopted when the argument structure of the potential antecedent was inappropriate for the Gapping remnants. Incorporating an agreement match/mismatch manipulation enables investigation of whether mismatched number of the subject can influence spray/load-mismatch detection.

- (202) a. The boys load the trucks with the fruit and the men with the vegetables slowly put up the signs for the produce stand.
Agreement match, argument-structure match
- b. The boy loads the trucks with the fruit and the men with the vegetables slowly put up the signs for the produce stand.
Agreement mismatch, argument-structure match
- c. The boys load the fruit on the trucks and the men with the vegetables slowly put up the signs for the produce stand.
Agreement match, argument-structure mismatch
- d. The boy loads the fruit on the trucks and the men with the vegetables slowly put up the signs for the produce stand.
Agreement mismatch, argument-structure mismatch

A slowdown effect in the region after the potential Gapping remnant PP (in the examples here, *slowly*) should be observed, caused by the parser discarding a possible Gapping parse. This is consistent with prior work. If ϕ -features are processed before θ -roles (or pre-empt them in retrieval), an agreement mismatch effect should be observed at the right remnant region (the PP *with the vegetables*) or the spillover region (a manner adverb; in 202, *slowly*) in both (202b) and (202d). In argument-structure-matched conditions (a and c), at the point of the PP a Gapping parse is still possible; at the position of the manner adverb, however, this parse should have to be discarded in all conditions because of Gapping's resistance to a third remnant.

Similarly, this later slowdown effect in the region at or after the PP, caused by the parser discarding the possible Gapping parse, should be significantly mitigated in (202b) relative to (202a), because the agreement mismatch (*loads/load*) will have already biased the parser against the Gapping parse.

On the other hand if θ -roles are processed before ϕ -features, the mismatch effect at or after the PP should be confined to (202b), since the spray/load mismatch will have already ruled out the Gapping parse, and should be identical in (202a) and (202b).

5.1.1.3. Procedure. 40 native English speakers at Northwestern read 24 sentences like (202) (see Appendix for stimuli list) while their eye movements were tracked. (Two subjects had to be discarded because of corruption in their data files.) The sentences were pseudo-randomly distributed among 96 filler sentences drawn from other experiments not reported here, of four different types: 24 sentences containing complex relative clauses with potential parasitic gaps, 24 with potential Garden Path relative clauses varying the gender match of a reflexive with its antecedent, 24 containing long-distance *wh*-extractions, and 24 containing backwards sluicing varying the animacy/plausibility of the pivot of an embedded *wh*-question. No fillers contained Gapping, spray/load manipulations, or verbal agreement manipulations.

The resulting data was manually corrected for vertical drift and to remove blinks, and was analyzed using mixed-effect linear regressions, with model comparison to derive p-values. Analysis was conducted using the R statistical software by comparing maximally specified linear mixed effects regressions models (lmers) with comparison models which have an effect of interest removed. β -values and standard errors were calculated on the basis of the maximal model.² Maximal models consisted of the two experimental manipulations

²When the maximal model did not converge, its random effects structure was simplified by removing interactions and order parameters from the random slopes until convergence was reached, and reduced models were simplified correspondingly.

spray/load match/mismatch and *agreement match/mismatch* (with levels contrast coded as 0.5 and -0.5 to sum to 0), a presentation order term, and random slopes and intercepts for the interaction of the two fixed effects, plus the presentation order, by subject and item.³ To correct for outliers, reading times for a given reading time measure were transformed on a log scale before analysis. Model comparison using ANOVA was used to derive p-values and χ^2 values. First-fixation times, first-pass times, and regression path durations were analyzed at the PP region (in (202), *with the vegetables*), the disambiguation region (a manner adverb; in (202), *slowly*) and a spillover region after the manner adverb.

5.1.1.4. Results. As shown in figure (5.1), there was a significant interaction of agreement and argument-structure in regression path duration at the disambiguation region (the manner adverb; in (202), *slowly*), such that condition (c), with argument-structure mismatch plus agreement-match, was read significantly faster than the other conditions ($\beta = 4.681\text{e-}01$, $\text{SE} = 2.067\text{e-}01$; χ^2 from ANOVA model comparison = 5.0471 (df=1), $p = 0.02467$). There were no main effects, and no effects in other reading-time measures at this region. There were no significant effects on any reading-time measures at other regions.

5.1.1.5. Discussion. A possible explanation for this superficially confusing result comes from previous work on the role of agreement in antecedent retrieval. Wagers et al. (2009) investigate the so-called ‘agreement attraction effect’, wherein a matrix verb occurs bearing agreement morphology appropriate not to its grammatical subject, but instead to an intervening or distractor noun phrase, as in (203), in which the *be*-verb is in its plural form *are* rather than the grammatically licit form *is*—while the actual subject of the verb, *the key*, is singular, the intervening NP *the cabinets* can cause confusion and trigger erroneous plural agreement on the verb. While (203) is ungrammatical (the grammatical version of this sentence is 204), sentences of this kind are attested robustly in corpora: this is the agreement attraction effect.

(203) * The key to the cabinets are in the drawer.

(204) The key to the cabinets is in the drawer.

Wagers et al. (2009) investigated agreement-attraction contexts similar to (203) in a series of self-paced reading experiments to determine whether the agreement-attraction effect was due to imprecise representation

³The maximal model (before potential simplification to yield convergence) is as follows: $\text{lmer}(rt \sim sl*agr + order + (1 + sl*agr + order | subject) + (1 + sl*agr + order | item))$, where *rt* is the reading-time measure, *sl* is the spray/load manipulation factor, and *agr* is the agreement manipulation factor.

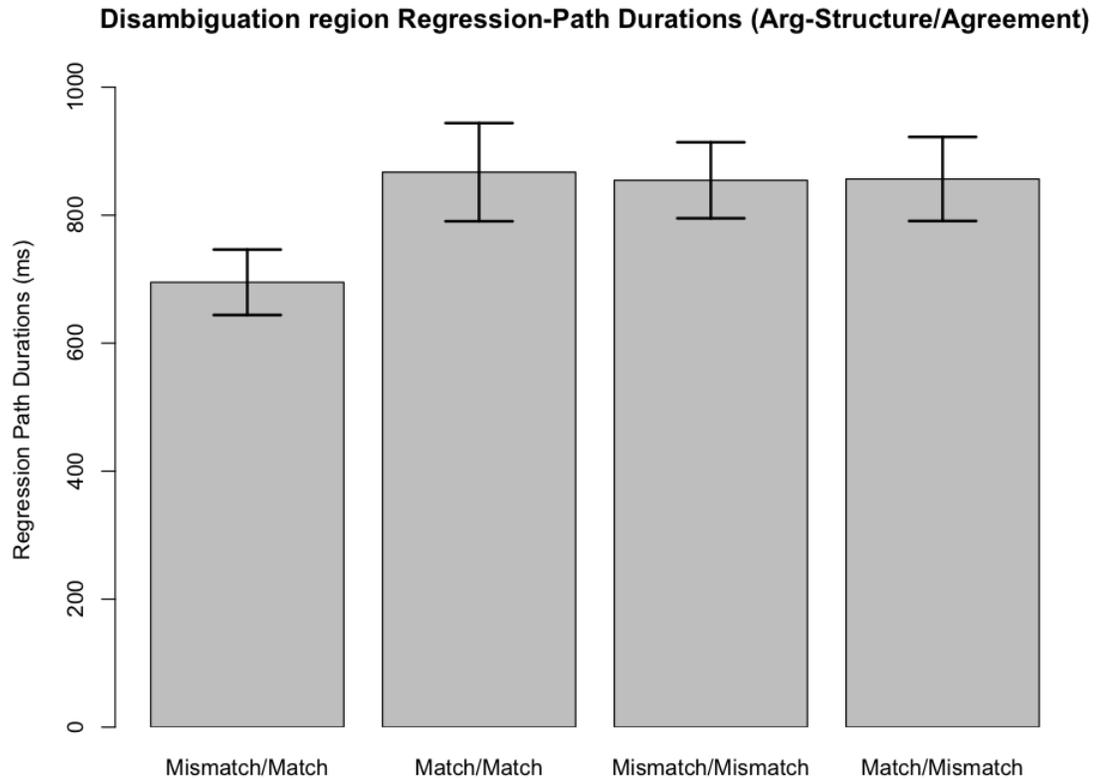


Figure 5.1.

of the agreement features of the subject or due to imperfectly-accurate retrieval of the subject's agreement features. Importantly for the present discussion, they found that agreement-attraction effects in comprehension were limited to ungrammatical conditions, as indexed by an attenuation of the reading-time slowdown effect induced by subject-verb mismatch in sentences containing a plural 'distractor' noun conflicting with the agreement features of the subject, as in 203; no analogous effect was found in grammatical conditions. Wagers et al. (2009) hypothesize that this pattern, such that the parser considers ungrammatical agreement controllers only when no grammatical controller is available, could be explained by a content-addressable, cue-based retrieval system in one of two ways: either the system is sensitive enough to grammatical cues that the grammatical agreement-controller almost always outcompetes ungrammatical distractors, which thus only influence reading times when no grammatical controller is present, or the content-addressable system is only engaged when a structure-based search for the agreement controller fails.

The pattern observed in this experiment is comprehensible on either of the explanations proposed by Wagers et al. (2009) for their data, but it may be most consistent with the latter explanation, wherein content-addressable cue-based antecedent search is a fallback system triggered when no grammatical antecedent is present.

If antecedent retrieval only considers ungrammatical candidate antecedents when no grammatical antecedent is found, the agreement match facilitation effect found here might be a signal of the parser's having detected that its previously posited Gapping parse was unavailable and automatically engaging a cue-based retrieval system to attempt to find another antecedent, as in (Wagers et al., 2009)'s interpretation of their results. On the other hand, if grammatical antecedents outcompete ungrammatical antecedents when a grammatical antecedent is present, it may be only in conditions that lack a licit Gapping parse at all that agreement-features, rather than the grammatically-relevant θ -role features of the verb phrase, factor into the parser's consideration of whether or not to posit a Gapping parse at all. However, this explanation suffers from the fact that the effect observed in this experiment occurred at the disambiguation region (the manner adverb), after the parser had two pieces of bottom-up evidence it was not in a Gapping configuration: the spray/load mismatch, and the manner adverb itself. It is thus not clear why initial antecedent retrieval would be occurring at this point in the parse. On the other hand, if a Gapping parse has already been posited and the parser, upon detecting that this initial Gapping parse was ungrammatical, initiated a search for a different antecedent, it may be erroneously retrieving the same candidate antecedent as on its initial parse (since there is no competitor candidate antecedent) but having an easier time doing so when this antecedent's agreement features match those of the Gapped verb.

CHAPTER 6

Conclusion

This dissertation has investigated the role of agreement-related ϕ -features in the representation and processing of Gapping and related elliptical constructions. After a brief overview of the topic and research landscape in Chapter 1, in Chapter 2 I provided arguments that Gapping examples are structurally-ambiguous elliptical configurations.

Chapter 2 begins with a survey of my prior work on this topic and extends the structural ambiguity proposal found therein with new arguments from unusual embedded Gapping configurations and from the Gapping-like configurations of subGapping and Left-Peripheral Ellipsis. Along the way, Chapter 2 also investigates the behavior of morphosyntactic mismatch in several such Gapping-like constructions and proposes that feature-mismatch is tolerated only provided a copy of the relevant features is visible outside the ellipsis site. In this way, Chapter 2 sets the stage for Chapter 3, in which I present several cases where ϕ -features, though not normally relevant to the calculus of antecedent-ellipsis identity, can result in degradation when mismatched. In that chapter I propose an analysis of the difference between Gapping's toleration of ϕ -feature mismatch in terms of slightly differently sized ellipses in these languages, and conclude that the antecedent-ellipsis identity condition, even when sensitive to ϕ -feature mismatch, cannot be calculated solely on the basis of surface form.

Chapters 4 and 5 constitute the experimental portion of this dissertation, and together present eight experiments to investigate the parser's use of ϕ -feature in retrieving the antecedent of a Gapping configuration and in predictively identifying a Gapping configuration in its input, respectively. Chapter 4 provides evidence that multiple Gapping antecedents can interfere with one another in retrieval in a manner consistent with a cue-based retrieval system, at least for the ϕ -feature of Number.

In Chapter 5, I provided some evidence that the parser's antecedent-retrieval mechanism may show cue-based signatures (such as retrieval interference effects) only when candidate antecedents need to be

distinguished in memory: when multiple candidate antecedents are present, as in the experiments reported in Chapter 4, or when the initially structurally-accessible antecedent is grammatically illicit, as in the experiment reported in Chapter 5 itself.

Overall, the theoretical and experimental chapters together implicate a substantial role for ϕ -features in grammar and processing, being on par (in principle, if not usually in practice) with other features in the grammar's calculus of antecedent-ellipsis identity, and being utilized as retrieval cues in parsing even when not grammatically necessary.

More speculatively, the results of the experiments reported here may bear (modulo the caveats discussed above) on the relationship between the parser and the grammar more generally. Theory-neutrally, the observation that agreement-matching can affect the processing of Gapping sentences for which agreement-matching is grammatically irrelevant (because it does not determine acceptability in the languages/constructions in question) suggests that, however this relationship is to be analyzed in detail, the relationship between the parser and Universal Grammar, the meta-grammar that constrains the possible forms of the grammars of individual languages, is rather tighter than the relationship between the parser and the grammar of any individual language variety. One way to analyze this kind of grammar-parser relationship is naturally formulable within constraint-competition frameworks such as Optimality Theory (Prince & Smolensky, 1993) or Harmonic Grammar (Legendre et al., 1990), where there are no language-particular rules or constraints at all and instead rules or constraints that are 'inoperative' in the grammar of a particular language are simply outranked or outweighed by constraints that are, for the language in question, more important. In such a framework, this kind of grammar-parser relationship can be conceptualized in terms of a threshold, such that when a constraint is ranked or weighted above this threshold it is able to impact the acceptability of an example sentence when judged under conditions of reflective equilibrium, as measured in acceptability judgment tasks; and when it is ranked or weighted below that threshold it does not influence the introspective acceptability of an expression, but its influence may still be detectable in finer-grained measures of language use.

But the kind of grammar-parser relationship evidenced in the experiments reported above is not necessarily restricted to such an analysis: on the one hand, it may be that language-particular rules (such as the Hebrew person-sensitivity discussed in Chapter 3) are constrained to only make reference to those features

of lexical items that the parser innately attends to, quite apart of whatever form these rules or constraints are stated in. If, for whatever reason, the parser is innately attuned to person, number and gender features, the prevalence of these features in grammatical patterns across the world's languages would follow on this account. (There do not, to my knowledge, appear to be any syntactic patterns in any language that make reference to lexical information about the color of the objects denoted by noun phrases, for example, or about the time of day denoted by temporal expressions.) On the other hand, the relation could be the reverse: if the abstract form of UG, the meta-grammar, is such that the only features of a DP that can be relevant for language-particular grammatical patterns are the ϕ -features (and possibly animacy), the parser may be sensitive to this meta-grammatical property in such a way that it attends to these features by default, whether or not they are relevant in the language/construction in question. On either of these accounts, the behavior of the parser and the form of the grammar are mutually constrained; but it will depend upon further research to determine which of these possibilities, or some other as yet unconsidered, is correct.

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.1. Appendix

.1.1. Stimuli from Experiments 4.2.2 and 4.3.4

- 1
 - a. Andrew supposes that Timothy swims at the gym and Robert at the beach, and so they are used to different water temperatures.
 - b. Andrew supposes Timothy swims at the gym and Robert at the beach, and so they are used to different water temperatures.
 - c. Andrew supposes you swim at the gym and Robert at the beach, and so you are used to different water temperatures.
 - d. Andrew supposes that you swim at the gym and Robert at the beach, and so you are used to different water temperatures.
- 2
 - a. Carolyn remembers that Rebecca drinks gin and Catherine vodka, and so we've decided to keep both in the mini-bar.
 - b. Carolyn remembers Rebecca drinks gin and Catherine vodka, and so we've decided to keep both in the mini-bar.
 - c. Carolyn remembers you drink gin and Catherine vodka, and so we've decided to keep both in the mini-bar.
 - d. Carolyn remembers that you drink gin and Catherine vodka, and so we've decided to keep both in the mini-bar.
- 3
 - a. Christopher supposes that Jose drives a pickup truck and Jeffrey a midsize sedan, and so they spend very different amounts on gas.
 - b. Christopher supposes Jose drives a pickup truck and Jeffrey a midsize sedan, and so they spend very different amounts on gas.
 - c. Christopher supposes you drive a pickup truck and Jeffrey a midsize sedan, and so you spend very different amounts on gas.
 - d. Christopher supposes that you drive a pickup truck and Jeffrey a midsize sedan, and so you spend very different amounts on gas.

- 4
 - a. Cynthia suspects that Anna commutes via the train and Marie via the bus, and so they may arrive at different times.
 - b. Cynthia suspects Anna commutes via the train and Marie via the bus, and so they may arrive at different times.
 - c. Cynthia suspects you commute via the train and Marie via the bus, and so you may arrive at different times.
 - d. Cynthia suspects that you commute via the train and Marie via the bus, and so you may arrive at different times.
- 5
 - a. Donna believes that Pamela votes for the Populist Party and Amanda for the Green Party, and so it's best they don't discuss politics.
 - b. Donna believes Pamela votes for the Populist Party and Amanda for the Green Party, and so it's best they don't discuss politics.
 - c. Donna believes you vote for the Populist Party and Amanda for the Green Party, and so it's best you don't discuss politics.
 - d. Donna believes that you vote for the Populist Party and Amanda for the Green Party, and so it's best you don't discuss politics.
- 6
 - a. Dorothy assumes that Virginia works from home and Janet in an office, and so they usually see one another only at social events.
 - b. Dorothy assumes Virginia works from home and Janet in an office, and so they usually see one another only at social events.
 - c. Dorothy assumes you work from home and Janet in an office, and so you usually see one another only at social events.
 - d. Dorothy assumes that you work from home and Janet in an office, and so you usually see one another only at social events.
- 7
 - a. Douglas knows that William lives in a condo and Kenneth in a duplex, and so they both have enough space to have guests over.

- b. Douglas knows William lives in a condo and Kenneth in a duplex, and so they both have enough space to have guests over.
 - c. Douglas knows you live in a condo and Kenneth in a duplex, and so you both have enough space to have guests over.
 - d. Douglas knows that you live in a condo and Kenneth in a duplex, and so you both have enough space to have guests over.
- 8
- a. Frank knows that Edward reads historical fiction and Larry poetry collections, and so they don't borrow books from one another very often.
 - b. Frank knows Edward reads historical fiction and Larry poetry collections, and so they don't borrow books from one another very often.
 - c. Frank knows you read historical fiction and Larry poetry collections, and so you don't borrow books from one another very often.
 - d. Frank knows that you read historical fiction and Larry poetry collections, and so you don't borrow books from one another very often.
- 9
- a. Harold understands that Brian wakes up at 6:45 and Henry at 7:30, and so they both go to bed at a reasonable hour.
 - b. Harold understands Brian wakes up at 6:45 and Henry at 7:30, and so they both go to bed at a reasonable hour.
 - c. Harold understands you wake up at 6:45 and Henry at 7:30, and so you both go to bed at a reasonable hour.
 - d. Harold understands that you wake up at 6:45 and Henry at 7:30, and so you both go to bed at a reasonable hour.
- 10
- a. Jessica believes that Stephanie watches action movies and Barbara romantic comedies, and so they don't often go to the movies together.
 - b. Jessica believes Stephanie watches action movies and Barbara romantic comedies, and so they don't often go to the movies together.

- c. Jessica believes you watch action movies and Barbara romantic comedies, and so you don't often go to the movies together.
 - d. Jessica believes that you watch action movies and Barbara romantic comedies, and so you don't often go to the movies together.
- 11
- a. Joseph thinks that Stephen speaks with a slight lisp and Steven with a subtle accent, and so they both take extra care during public speaking.
 - b. Joseph thinks Stephen speaks with a slight lisp and Steven with a subtle accent, and so they both take extra care during public speaking.
 - c. Joseph thinks you speak with a slight lisp and Steven with a subtle accent, and so you both take extra care during public speaking.
 - d. Joseph thinks that you speak with a slight lisp and Steven with a subtle accent, and so you both take extra care during public speaking.
- 12
- a. Lisa suspects that Martha prefers black beans and Mary pinto beans, and so they always keep both in the pantry.
 - b. Lisa suspects Martha prefers black beans and Mary pinto beans, and so they always keep both in the pantry.
 - c. Lisa suspects you prefer black beans and Mary pinto beans, and so you always keep both in the pantry.
 - d. Lisa suspects that you prefer black beans and Mary pinto beans, and so you always keep both in the pantry.
- 13
- a. Margaret remembers that Brenda jogs in the morning and Sharon in the evening, and so it's unlikely they'll run into each other.
 - b. Margaret remembers Brenda jogs in the morning and Sharon in the evening, and so it's unlikely they'll run into each other.
 - c. Margaret remembers you jog in the morning and Sharon in the evening, and so it's unlikely you'll run into each other.

- d. Margaret remembers that you jog in the morning and Sharon in the evening, and so it's unlikely you'll run into each other.
- 14
- a. Matthew thinks that Peter plays soccer and Anthony tennis, and so they often go to the fitness center together.
 - b. Matthew thinks Peter plays soccer and Anthony tennis, and so they often go to the fitness center together.
 - c. Matthew thinks you play soccer and Anthony tennis, and so you often go to the fitness center together.
 - d. Matthew thinks that you play soccer and Anthony tennis, and so you often go to the fitness center together.
- 15
- a. Sandra assumes that Elizabeth studies economics and Maria sociology, and so they rarely have classes in the same building.
 - b. Sandra assumes Elizabeth studies economics and Maria sociology, and so they rarely have classes in the same building.
 - c. Sandra assumes you study economics and Maria sociology, and so you rarely have classes in the same building.
 - d. Sandra assumes that you study economics and Maria sociology, and so you rarely have classes in the same building.
- 16
- a. Thomas understands that Walter likes potato salad and Kevin pasta salad, and so we brought both to the picnic.
 - b. Thomas understands Walter likes potato salad and Kevin pasta salad, and so we brought both to the picnic.
 - c. Thomas understands you like potato salad and Kevin pasta salad, and so we brought both to the picnic.
 - d. Thomas understands that you like potato salad and Kevin pasta salad, and so we brought both to the picnic.

.1.2. Stimuli from Experiment 4.3.2

- 1
 - a. The general supposes the janitor swims at the gym and the writer at the beach, but no one is completely sure which is which.
 - b. The generals suppose the janitor swims at the gym and the writer at the beach, but no one is completely sure which is which.
 - c. The general supposes the janitors swim at the gym and the writer at the beach, but no one is completely sure which is which.
 - d. The generals suppose the janitors swim at the gym and the writer at the beach, but no one is completely sure which is which.
- 2
 - a. The secretary guesses the commander drinks gin and the teacher vodka, and so they've ended up with both in the mini-bar.
 - b. The secretaries guess the commander drinks gin and the teacher vodka, and so they've ended up with both in the mini-bar.
 - c. The secretary guesses the commanders drink gin and the teacher vodka, and so they've ended up with both in the mini-bar.
 - d. The secretaries guess the commanders drink gin and the teacher vodka, and so they've ended up with both in the mini-bar.
- 3
 - a. The warden supposes the florist drives a pickup truck and the editor a midsize sedan, but the lot is so crowded it's hard to tell.
 - b. The wardens suppose the florist drives a pickup truck and the editor a midsize sedan, but the lot is so crowded it's hard to tell.
 - c. The warden supposes the florists drive a pickup truck and the editor a midsize sedan, but the lot is so crowded it's hard to tell.
 - d. The wardens suppose the florists drive a pickup truck and the editor a midsize sedan, but the lot is so crowded it's hard to tell.

- 4
 - a. The prisoner suspects the executive commutes via the train and the doctor via the bus, and either way it shows how nice the transit system is.
 - b. The prisoners suspect the executive commutes via the train and the doctor via the bus, and either way it shows how nice the transit system is.
 - c. The prisoner suspects the executives commute via the train and the doctor via the bus, and either way it shows how nice the transit system is.
 - d. The prisoners suspect the executives commute via the train and the doctor via the bus, and either way it shows how nice the transit system is.
- 5
 - a. The engineer believes the detective votes for the Populist Party and the artist for the Green Party, but of course they don't discuss politics at work.
 - b. The engineers believe the detective votes for the Populist Party and the artist for the Green Party, but of course they don't discuss politics at work.
 - c. The engineer believes the detectives vote for the Populist Party and the artist for the Green Party, but of course they don't discuss politics at work.
 - d. The engineers believe the detectives vote for the Populist Party and the artist for the Green Party, but of course they don't discuss politics at work.
- 6
 - a. The clown assumes the lawyer works from home and the tailor in an office, but if the work gets done it makes very little difference.
 - b. The clowns assume the lawyer works from home and the tailor in an office, but if the work gets done it makes very little difference.
 - c. The clown assumes the lawyers work from home and the tailor in an office, but if the work gets done it makes very little difference.
 - d. The clowns assume the lawyers work from home and the tailor in an office, but if the work gets done it makes very little difference.
- 7
 - a. The butler presumes the judge lives in a condo and the analyst in a duplex, either of which would be enough space to have guests over.

- b. The butlers presume the judge lives in a condo and the analyst in a duplex, either of which would be enough space to have guests over.
 - c. The butler presumes the judges live in a condo and the analyst in a duplex, either of which would be enough space to have guests over.
 - d. The butlers presume the judges live in a condo and the analyst in a duplex, either of which would be enough space to have guests over.
- 8
- a. The designer presumes the student reads historical fiction and the soldier poetry collections, and so they don't talk about books very often.
 - b. The designers presume the student reads historical fiction and the soldier poetry collections, and so they don't talk about books very often.
 - c. The designer presumes the students read historical fiction and the soldier poetry collections, and so they don't talk about books very often.
 - d. The designers presume the students read historical fiction and the soldier poetry collections, and so they don't talk about books very often.
- 9
- a. The decorator imagines the coroner wakes up at 6:45 and the goalie at 7:30, but when one works nights it's hard to be certain.
 - b. The decorators imagine the coroner wakes up at 6:45 and the goalie at 7:30, but when one works nights it's hard to be certain.
 - c. The decorator imagines the coroners wake up at 6:45 and the goalie at 7:30, but when one works nights it's hard to be certain.
 - d. The decorators imagine the coroners wake up at 6:45 and the goalie at 7:30, but when one works nights it's hard to be certain.
- 10
- a. The counselor believes the spy watches action movies and the waiter romantic comedies, and so they don't often go to the movies together.
 - b. The counselors believe the spy watches action movies and the waiter romantic comedies, and so they don't often go to the movies together.

- c. The counselor believes the spies watch action movies and the waiter romantic comedies, and so they don't often go to the movies together.
 - d. The counselors believe the spies watch action movies and the waiter romantic comedies, and so they don't often go to the movies together.
- 11
- a. The dentist thinks the attendant speaks with a slight lisp and the driver with a subtle accent, neither of which is anything to be ashamed of.
 - b. The dentists think the attendant speaks with a slight lisp and the driver with a subtle accent, neither of which is anything to be ashamed of.
 - c. The dentist thinks the attendants speak with a slight lisp and the driver with a subtle accent, neither of which is anything to be ashamed of.
 - d. The dentists think the attendants speak with a slight lisp and the driver with a subtle accent, neither of which is anything to be ashamed of.
- 12
- a. The surgeon suspects the maid prefers black beans and the pilot pinto beans, but no one will find out for a few more days.
 - b. The surgeons suspect the maid prefers black beans and the pilot pinto beans, but no one will find out for a few more days.
 - c. The surgeon suspects the maids prefer black beans and the pilot pinto beans, but no one will find out for a few more days.
 - d. The surgeons suspect the maids prefer black beans and the pilot pinto beans, but no one will find out for a few more days.
- 13
- a. The chef guesses the director jogs in the morning and the sailor in the evening, both times that reduce the risk of heat exhaustion.
 - b. The chefs guess the director jogs in the morning and the sailor in the evening, both times that reduce the risk of heat exhaustion.
 - c. The chef guesses the directors jog in the morning and the sailor in the evening, both times that reduce the risk of heat exhaustion.

- d. The chefs guess the directors jog in the morning and the sailor in the evening, both times that reduce the risk of heat exhaustion.
- 14
- a. The builder thinks the nurse plays soccer and the actor tennis, both of which are good cardiovascular exercise.
 - b. The builders think the nurse plays soccer and the actor tennis, both of which are good cardiovascular exercise.
 - c. The builder thinks the nurses play soccer and the actor tennis, both of which are good cardiovascular exercise.
 - d. The builders think the nurses play soccer and the actor tennis, both of which are good cardiovascular exercise.
- 15
- a. The reporter assumes the juggler studies economics and the rancher sociology, but none of them see each other on campus much.
 - b. The reporters assume the juggler studies economics and the rancher sociology, but none of them see each other on campus much.
 - c. The reporter assumes the jugglers study economics and the rancher sociology, but none of them see each other on campus much.
 - d. The reporters assume the jugglers study economics and the rancher sociology, but none of them see each other on campus much.
- 16
- a. The inspector imagines the architect enjoys potato salad and the dancer pasta salad, and it looks like someone brought both to the picnic.
 - b. The inspectors imagine the architect enjoys potato salad and the dancer pasta salad, and it looks like someone brought both to the picnic.
 - c. The inspector imagines the architects enjoy potato salad and the dancer pasta salad, and it looks like someone brought both to the picnic.
 - d. The inspectors imagine the architects enjoy potato salad and the dancer pasta salad, and it looks like someone brought both to the picnic.

.1.3. Stimuli from Experiment 4.3.3

- 1
 - a. Andrew supposes Timothy swims at the gym and Robert at the beach, but no one is completely sure which is which.
 - b. I suppose you swim at the gym and Robert at the beach, but no one is completely sure which is which.
 - c. You suppose I swim at the gym and Robert at the beach, but no one is completely sure which is which.
 - d. Andrew supposes I swim at the gym and Robert at the beach, but no one is completely sure which is which.
 - e. Andrew supposes you swim at the gym and Robert at the beach, but no one is completely sure which is which.
 - f. I suppose Timothy swims at the gym and Robert at the beach, but no one is completely sure which is which.
 - g. You suppose Timothy swims at the gym and Robert at the beach, but no one is completely sure which is which.
- 2
 - a. Carolyn guesses Rebecca drinks gin and Catherine vodka, and so they've ended up with both in the mini-bar.
 - b. I guess you drink gin and Catherine vodka, and so they've ended up with both in the mini-bar.
 - c. You guess I drink gin and Catherine vodka, and so they've ended up with both in the mini-bar.
 - d. Carolyn guesses I drink gin and Catherine vodka, and so they've ended up with both in the mini-bar.
 - e. Carolyn guesses you drink gin and Catherine vodka, and so they've ended up with both in the mini-bar.
 - f. I guess Rebecca drinks gin and Catherine vodka, and so they've ended up with both in the mini-bar.

- g. You guess Rebecca drinks gin and Catherine vodka, and so they've ended up with both in the mini-bar.
- 3 a. Christopher supposes Jose drives a pickup truck and Jeffrey a midsize sedan, but the lot is so crowded it's hard to tell.
- b. I suppose you drive a pickup truck and Jeffrey a midsize sedan, but the lot is so crowded it's hard to tell.
- c. You suppose I drive a pickup truck and Jeffrey a midsize sedan, but the lot is so crowded it's hard to tell.
- d. Christopher supposes I drive a pickup truck and Jeffrey a midsize sedan, but the lot is so crowded it's hard to tell.
- e. Christopher supposes you drive a pickup truck and Jeffrey a midsize sedan, but the lot is so crowded it's hard to tell.
- f. I suppose Jose drives a pickup truck and Jeffrey a midsize sedan, but the lot is so crowded it's hard to tell.
- g. You suppose Jose drives a pickup truck and Jeffrey a midsize sedan, but the lot is so crowded it's hard to tell.
- 4 a. Cynthia suspects Anna commutes via the train and Marie via the bus, and either way it shows how nice the transit system is.
- b. I suspect you commute via the train and Marie via the bus, and either way it shows how nice the transit system is.
- c. You suspect I commute via the train and Marie via the bus, and either way it shows how nice the transit system is.
- d. Cynthia suspects I commute via the train and Marie via the bus, and either way it shows how nice the transit system is.
- e. Cynthia suspects you commute via the train and Marie via the bus, and either way it shows how nice the transit system is.

- f. I suspect Anna commutes via the train and Marie via the bus, and either way it shows how nice the transit system is.
 - g. You suspect Anna commutes via the train and Marie via the bus, and either way it shows how nice the transit system is.
- 5
- a. Donna believes Pamela votes for the Populist Party and Amanda for the Green Party, but of course they don't discuss politics at work.
 - b. I believe you vote for the Populist Party and Amanda for the Green Party, but of course they don't discuss politics at work.
 - c. You believe I vote for the Populist Party and Amanda for the Green Party, but of course they don't discuss politics at work.
 - d. Donna believes I vote for the Populist Party and Amanda for the Green Party, but of course they don't discuss politics at work.
 - e. Donna believes you vote for the Populist Party and Amanda for the Green Party, but of course they don't discuss politics at work.
 - f. I believe Pamela votes for the Populist Party and Amanda for the Green Party, but of course they don't discuss politics at work.
 - g. You believe Pamela votes for the Populist Party and Amanda for the Green Party, but of course they don't discuss politics at work.
- 6
- a. Dorothy assumes Virginia works from home and Janet in an office, but if the work gets done it makes very little difference.
 - b. I assume you work from home and Janet in an office, but if the work gets done it makes very little difference.
 - c. You assume I work from home and Janet in an office, but if the work gets done it makes very little difference.
 - d. Dorothy assumes I work from home and Janet in an office, but if the work gets done it makes very little difference.

- e. Dorothy assumes you work from home and Janet in an office, but if the work gets done it makes very little difference.
 - f. I assume Virginia works from home and Janet in an office, but if the work gets done it makes very little difference.
 - g. You assume Virginia works from home and Janet in an office, but if the work gets done it makes very little difference.
- 7
- a. Douglas presumes William lives in a condo and Kenneth in a duplex, either of which would be enough space to have guests over.
 - b. I presume you live in a condo and Kenneth in a duplex, either of which would be enough space to have guests over.
 - c. You presume I live in a condo and Kenneth in a duplex, either of which would be enough space to have guests over.
 - d. Douglas presumes I live in a condo and Kenneth in a duplex, either of which would be enough space to have guests over.
 - e. Douglas presumes you live in a condo and Kenneth in a duplex, either of which would be enough space to have guests over.
 - f. I presume William lives in a condo and Kenneth in a duplex, either of which would be enough space to have guests over.
 - g. You presume William lives in a condo and Kenneth in a duplex, either of which would be enough space to have guests over.
- 8
- a. Frank presumes Edward reads historical fiction and Larry poetry collections, and so they don't talk about books very often.
 - b. I presume you read historical fiction and Larry poetry collections, and so they don't talk about books very often.
 - c. You presume I read historical fiction and Larry poetry collections, and so they don't talk about books very often.

- d. Frank presumes I read historical fiction and Larry poetry collections, and so they don't talk about books very often.
 - e. Frank presumes you read historical fiction and Larry poetry collections, and so they don't talk about books very often.
 - f. I presume Edward reads historical fiction and Larry poetry collections, and so they don't talk about books very often.
 - g. You presume Edward reads historical fiction and Larry poetry collections, and so they don't talk about books very often.
- 9
- a. Harold imagines Brian wakes up at:45 and Henry at:30, but when one works nights it's hard to be certain.
 - b. I imagine Brian wakes up at:45 and Henry at:30, but when one works nights it's hard to be certain.
 - c. You imagine Brian wakes up at:45 and Henry at:30, but when one works nights it's hard to be certain.
 - d. Harold imagines I wake up at:45 and Henry at:30, but when one works nights it's hard to be certain.
 - e. Harold imagines you wake up at:45 and Henry at:30, but when one works nights it's hard to be certain.
 - f. I imagine you wake up at:45 and Henry at:30, but when one works nights it's hard to be certain.
 - g. You imagine I wake up at:45 and Henry at:30, but when one works nights it's hard to be certain.
- 10
- a. Jessica believes Barbara watches action movies and Stephanie romantic comedies, and so they don't often go to the movies together.
 - b. I believe Barbara watches action movies and Stephanie romantic comedies, and so they don't often go to the movies together.
 - c. You believe Barbara watches action movies and Stephanie romantic comedies, and so they don't often go to the movies together.

- d. Jessica believes I watch action movies and Stephanie romantic comedies, and so they don't often go to the movies together.
 - e. Jessica believes you watch action movies and Stephanie romantic comedies, and so they don't often go to the movies together.
 - f. I believe you watch action movies and Stephanie romantic comedies, and so they don't often go to the movies together.
 - g. You believe I watch action movies and Stephanie romantic comedies, and so they don't often go to the movies together.
- 11
- a. Joseph thinks Maurice speaks with a slight lisp and Pedro with a subtle accent, neither of which is anything to be ashamed of.
 - b. I think Maurice speaks with a slight lisp and Pedro with a subtle accent, neither of which is anything to be ashamed of.
 - c. You think Maurice speaks with a slight lisp and Pedro with a subtle accent, neither of which is anything to be ashamed of.
 - d. Joseph thinks I speak with a slight lisp and Pedro with a subtle accent, neither of which is anything to be ashamed of.
 - e. Joseph thinks you speak with a slight lisp and Pedro with a subtle accent, neither of which is anything to be ashamed of.
 - f. I think you speak with a slight lisp and Pedro with a subtle accent, neither of which is anything to be ashamed of.
 - g. You think I speak with a slight lisp and Pedro with a subtle accent, neither of which is anything to be ashamed of.
- 12
- a. Lisa suspects Martha prefers black beans and Mary pinto beans, but no one will find out for a few more days.
 - b. I suspect Martha prefers black beans and Mary pinto beans, but no one will find out for a few more days.

- c. You suspect Martha prefers black beans and Mary pinto beans, but no one will find out for a few more days.
 - d. Lisa suspects I prefer black beans and Mary pinto beans, but no one will find out for a few more days.
 - e. Lisa suspects you prefer black beans and Mary pinto beans, but no one will find out for a few more days.
 - f. I suspect you prefer black beans and Mary pinto beans, but no one will find out for a few more days.
 - g. You suspect I prefer black beans and Mary pinto beans, but no one will find out for a few more days.
- 13
- a. Margaret guesses Brenda jogs in the morning and Julie in the evening, both times that reduce the risk of heat exhaustion.
 - b. I guess Brenda jogs in the morning and Julie in the evening, both times that reduce the risk of heat exhaustion.
 - c. You guess Brenda jogs in the morning and Julie in the evening, both times that reduce the risk of heat exhaustion.
 - d. Margaret guesses I jog in the morning and Julie in the evening, both times that reduce the risk of heat exhaustion.
 - e. Margaret guesses you jog in the morning and Julie in the evening, both times that reduce the risk of heat exhaustion.
 - f. I guess you jog in the morning and Julie in the evening, both times that reduce the risk of heat exhaustion.
 - g. You guess I jog in the morning and Julie in the evening, both times that reduce the risk of heat exhaustion.
- 14
- a. Matthew thinks Peter plays soccer and Anthony tennis, both of which are good cardiovascular exercise.

- b. I think Peter plays soccer and Anthony tennis, both of which are good cardiovascular exercise.
 - c. You think Peter plays soccer and Anthony tennis, both of which are good cardiovascular exercise.
 - d. Matthew thinks I play soccer and Anthony tennis, both of which are good cardiovascular exercise.
 - e. Matthew thinks you play soccer and Anthony tennis, both of which are good cardiovascular exercise.
 - f. I think you play soccer and Anthony tennis, both of which are good cardiovascular exercise.
 - g. You think I play soccer and Anthony tennis, both of which are good cardiovascular exercise.
- 15
- a. Sandra assumes Elizabeth studies economics and Sharon sociology, but none of them see each other on campus much.
 - b. I assume Elizabeth studies economics and Sharon sociology, but none of them see each other on campus much.
 - c. You assume Elizabeth studies economics and Sharon sociology, but none of them see each other on campus much.
 - d. Sandra assumes I study economics and Sharon sociology, but none of them see each other on campus much.
 - e. Sandra assumes you study economics and Sharon sociology, but none of them see each other on campus much.
 - f. I assume you study economics and Sharon sociology, but none of them see each other on campus much.
 - g. You assume I study economics and Sharon sociology, but none of them see each other on campus much.
- 16
- a. Thomas imagines Walter enjoys potato salad and Kevin pasta salad, and it looks like someone brought both to the picnic.
 - b. I imagine Walter enjoys potato salad and Kevin pasta salad, and it looks like someone brought both to the picnic.

- c. You imagine Walter enjoys potato salad and Kevin pasta salad, and it looks like someone brought both to the picnic.
- d. Thomas imagines I enjoy potato salad and Kevin pasta salad, and it looks like someone brought both to the picnic.
- e. Thomas imagines you enjoy potato salad and Kevin pasta salad, and it looks like someone brought both to the picnic.
- f. I imagine you enjoy potato salad and Kevin pasta salad, and it looks like someone brought both to the picnic.
- g. You imagine I enjoy potato salad and Kevin pasta salad, and it looks like someone brought both to the picnic.

.1.4. Stimuli from Experiment 5.1.1

- 1
 - a. The host brushes the pie crusts with the egg and the videographers with the butter courteously help to clean up.
 - b. The hosts brush the pie crusts with the egg and the videographers with the butter courteously help to clean up.
 - c. The host brushes the egg on the pie crusts and the videographers with the butter courteously help to clean up.
 - d. The hosts brush the egg on the pie crusts and the videographers with the butter courteously help to clean up.
- 2
 - a. The professional crams the suitcases with the clothes and the secretaries with the office supplies hurriedly arrange for a taxi.
 - b. The professionals cram the suitcases with the clothes and the secretaries with the office supplies hurriedly arrange for a taxi.
 - c. The professional crams the clothes in the suitcases and the secretaries with the office supplies hurriedly arrange for a taxi.

- d. The professionals cram the clothes in the suitcases and the secretaries with the office supplies hurriedly arrange for a taxi.
- 3
- a. The designer dabs the set pieces with the glitter and the actors with the paint nervously rehearse their lines backstage.
 - b. The designers dab the set pieces with the glitter and the actors with the paint nervously rehearse their lines backstage.
 - c. The designer dabs the glitter on the set pieces and the actors with the paint nervously rehearse their lines backstage.
 - d. The designers dab the glitter on the set pieces and the actors with the paint nervously rehearse their lines backstage.
- 4
- a. The mover drapes the furniture with the fabric and the homeowners with the tarps helpfully clean out the storage unit.
 - b. The movers drape the furniture with the fabric and the homeowners with the tarps helpfully clean out the storage unit.
 - c. The mover drapes the fabric on the furniture and the homeowners with the tarps helpfully clean out the storage unit.
 - d. The movers drape the fabric on the furniture and the homeowners with the tarps helpfully clean out the storage unit.
- 5
- a. The baker drizzles the buns with the glaze and the assistants with the chocolate quickly pre-heat the ovens.
 - b. The bakers drizzle the buns with the glaze and the assistants with the chocolate quickly pre-heat the ovens.
 - c. The baker drizzles the glaze on the buns and the assistants with the chocolate quickly pre-heat the ovens.
 - d. The bakers drizzle the glaze on the buns and the assistants with the chocolate quickly pre-heat the ovens.

- 6
 - a. The chef dusts the chicken with the flour and the waiters with the parsley carefully ensure that the orders are complete.
 - b. The chefs dust the chicken with the flour and the waiters with the parsley carefully ensure that the orders are complete.
 - c. The chef dusts the flour on the chicken and the waiters with the parsley carefully ensure that the orders are complete.
 - d. The chefs dust the flour on the chicken and the waiters with the parsley carefully ensure that the orders are complete.
- 7
 - a. The planner hangs the ballrooms with the streamers and the volunteers with the decorations gradually set up the refreshment table.
 - b. The planners hang the ballrooms with the streamers and the volunteers with the decorations gradually set up the refreshment table.
 - c. The planner hangs the streamers in the ballrooms and the volunteers with the decorations gradually set up the refreshment table.
 - d. The planners hang the streamers in the ballrooms and the volunteers with the decorations gradually set up the refreshment table.
- 8
 - a. The cowboy heaps the carts with the manure and the farmers with the hay lazily oversee the work.
 - b. The cowboys heap the carts with the manure and the farmers with the hay lazily oversee the work.
 - c. The cowboy heaps the manure on the carts and the farmers with the hay lazily oversee the work.
 - d. The cowboys heap the manure on the carts and the farmers with the hay lazily oversee the work.
- 9
 - a. The researcher injects the samples with the acid and the assistants with the saline anxiously wait for the signal to start the timer.
 - b. The researchers inject the samples with the acid and the assistants with the saline anxiously wait for the signal to start the timer.

- c. The researcher injects the acid in the samples and the assistants with the saline anxiously wait for the signal to start the timer.
 - d. The researchers inject the acid in the samples and the assistants with the saline anxiously wait for the signal to start the timer.
- 10
- a. The boy loads the trucks with the fruit and the men with the vegetables slowly put up the signs for the produce stand.
 - b. The boys load the trucks with the fruit and the men with the vegetables slowly put up the signs for the produce stand.
 - c. The boy loads the fruit on the trucks and the men with the vegetables slowly put up the signs for the produce stand.
 - d. The boys load the fruit on the trucks and the men with the vegetables slowly put up the signs for the produce stand.
- 11
- a. The employee packs the crates with the shoes and the supervisors with the accessories thoughtfully discuss rearranging the display cases.
 - b. The employees pack the crates with the shoes and the supervisors with the accessories thoughtfully discuss rearranging the display cases.
 - c. The employee packs the shoes in the crates and the supervisors with the accessories thoughtfully discuss rearranging the display cases.
 - d. The employees pack the shoes in the crates and the supervisors with the accessories thoughtfully discuss rearranging the display cases.
- 12
- a. The activist plasters the streetlamps with the flyers and the protesters with the posters cruelly harass and intimidate bystanders.
 - b. The activists plaster the streetlamps with the flyers and the protesters with the posters cruelly harass and intimidate bystanders.
 - c. The activist plasters the flyers on the streetlamps and the protesters with the posters cruelly harass and intimidate bystanders.

- d. The activists plaster the flyers on the streetlamps and the protesters with the posters cruelly harass and intimidate bystanders.
- 13
- a. The nun plants the windowboxes with the petunias and the students with the pansies silently line up to go to class.
 - b. The nuns plant the windowboxes with the petunias and the students with the pansies silently line up to go to class.
 - c. The nun plants the petunias in the windowboxes and the students with the pansies silently line up to go to class.
 - d. The nuns plant the petunias in the windowboxes and the students with the pansies silently line up to go to class.
- 14
- a. The cook rubs the steak with the garlic and the helpers with the marinade delicately adjust the seasoning.
 - b. The cooks rub the steak with the garlic and the helpers with the marinade delicately adjust the seasoning.
 - c. The cook rubs the garlic on the steak and the helpers with the marinade delicately adjust the seasoning.
 - d. The cooks rub the garlic on the steak and the helpers with the marinade delicately adjust the seasoning.
- 15
- a. The worker slathers the obstacles with the grease and the contestants with the slime tenaciously try their best to win.
 - b. The workers slather the obstacles with the grease and the contestants with the slime tenaciously try their best to win.
 - c. The worker slathers the grease on the obstacles and the contestants with the slime tenaciously try their best to win.
 - d. The workers slather the grease on the obstacles and the contestants with the slime tenaciously try their best to win.

- 16 a. The custodian smears the windows with the soap and the teachers with the ammonia vigorously shine the glass.
- b. The custodians smear the windows with the soap and the teachers with the ammonia vigorously shine the glass.
- c. The custodian smears the soap on the windows and the teachers with the ammonia vigorously shine the glass.
- d. The custodians smear the soap on the windows and the teachers with the ammonia vigorously shine the glass.
- 17 a. The artist splashes the canvas with the paint and the visitors with the lacquer curiously head to the participatory exhibit.
- b. The artists splash the canvas with the paint and the visitors with the lacquer curiously head to the participatory exhibit.
- c. The artist splashes the paint on the canvas and the visitors with the lacquer curiously head to the participatory exhibit.
- d. The artists splash the paint on the canvas and the visitors with the lacquer curiously head to the participatory exhibit.
- 18 a. The ensign sprays the runway with the antifreeze and the lieutenants with the solvent cautiously consider the tactical situation.
- b. The ensigns spray the runway with the antifreeze and the lieutenants with the solvent cautiously consider the tactical situation.
- c. The ensign sprays the antifreeze on the runway and the lieutenants with the solvent cautiously consider the tactical situation.
- d. The ensigns spray the antifreeze on the runway and the lieutenants with the solvent cautiously consider the tactical situation.
- 19 a. The diner spreads the bread with the butter and the guests with the jam hastily order some coffee.
- b. The diners spread the bread with the butter and the guests with the jam hastily order some coffee.

- c. The diner spreads the butter on the bread and the guests with the jam hastily order some coffee.
 - d. The diners spread the butter on the bread and the guests with the jam hastily order some coffee.
- 20
- a. The master sprinkles the sushi with the seaweed flakes and the apprentices with the sesame seeds attentively study the technique.
 - b. The masters sprinkle the sushi with the seaweed flakes and the apprentices with the sesame seeds attentively study the technique.
 - c. The master sprinkles the seaweed flakes on the sushi and the apprentices with the sesame seeds attentively study the technique.
 - d. The masters sprinkle the seaweed flakes on the sushi and the apprentices with the sesame seeds attentively study the technique.
- 21
- a. The husband spritzes the confections with the lemon oil and the children with the rosewater thoroughly grease the baking sheet.
 - b. The husbands spritz the confections with the lemon oil and the children with the rosewater thoroughly grease the baking sheet.
 - c. The husband spritzes the lemon oil on the confections and the children with the rosewater thoroughly grease the baking sheet.
 - d. The husbands spritz the lemon oil on the confections and the children with the rosewater thoroughly grease the baking sheet.
- 22
- a. The housekeeper squirts the vases with the polish and the maids with the cleanser quietly attend to their other duties.
 - b. The housekeepers squirt the vases with the polish and the maids with the cleanser quietly attend to their other duties.
 - c. The housekeeper squirts the polish on the vases and the maids with the cleanser quietly attend to their other duties.
 - d. The housekeepers squirt the polish on the vases and the maids with the cleanser quietly attend to their other duties.

- 23 a. The medic stuffs the wounds with the gauze and the technicians with the antibiotics closely monitor the patients.
- b. The medics stuff the wounds with the gauze and the technicians with the antibiotics closely monitor the patients.
- c. The medic stuffs the gauze in the wounds and the technicians with the antibiotics closely monitor the patients.
- d. The medics stuff the gauze in the wounds and the technicians with the antibiotics closely monitor the patients.
- 24 a. The clerk wraps the machines with the foam and the foremen with the cardboard diligently check the inventory.
- b. The clerks wrap the machines with the foam and the foremen with the cardboard diligently check the inventory.
- c. The clerk wraps the foam on the machines and the foremen with the cardboard diligently check the inventory.
- d. The clerks wrap the foam on the machines and the foremen with the cardboard diligently check the inventory.