

Scrambling, LF, and Phrase Structure Change in Yiddish

Joel C. Wallenberg
Newcastle University

Abstract:

This article proposes that Holmberg’s Generalization, the well-known constraint on Scandinavian object shift, can and should be extended as a general constraint on scrambling past c-commanding heads, and applies to the scrambling phenomena of German, Yiddish, Japanese, Korean, and other languages. In addition to evidence from the synchronic typology of scrambling and object shift, the existence of such a constraint can be shown most conclusively by careful observation of languages undergoing phrase structure changes over time. Specifically, we use the change in the position of Tense over the history of Yiddish as an experimental domain for testing the hypothesized constraint, and show that the change in Tense restricts the scrambling options in Yiddish precisely in the predicted manner. Once we have shown how scrambling is constrained empirically, we argue that the constraint stems from a condition on the interface between the narrow syntax and LF, the “Conservation of C-Command”, which ensures that the semantic scope of heads can still be calculated after various movement operations have applied in the syntax. Finally, we suggest that the empirical and theoretical results of the study provide indirect support for an antisymmetric view of phrase structure.

Keywords: Syntax, scrambling, Yiddish, German, LF, language change

1 Introduction

This paper argues for the existence of a universal constraint on the type of scrambling found in German, Korean, and Japanese (which begins to be described in the modern syntactic literature in Lenerz 1977; Mahajan 1990; Saito 1985; Webelhuth 1989, among many others; see also an overview and references in Richards 2004,

Thráinsson 2001, Wallenberg 2009).¹ Among other things, languages with scrambling frequently allow objects to move leftward over adjuncts, resulting in sentences like the German example in (1).

- (1) Johann hat [die Lebensmittel]_i auf dem Markt t_i gekauft.
 Johann has the groceries at the market bought.
 “Johann bought the groceries at the market.”

The following generalization, which I will refer to as the Generalized Holmberg Constraint (GHC), is an extension of the restriction known as Holmberg’s Generalization (Holmberg 1986). As should be obvious from the statement of the GHC below, the constraint applies to object shift of the Scandinavian and Early Modern English type, as well as to scrambling languages of the Japanese or German type.²

Generalized Holmberg Constraint:

Scrambling and object shift cannot move elements leftward past a c-commanding head.

It is perhaps obvious that such a constraint must exist, though it has rarely been explicitly mentioned in the literature (but see Svenonius 2001, for a very similar proposal). If it did not, then sentences like the one in (2) would be grammatical in German. In fact, there would be no such thing as a verb-second (V2) language which also allows scrambling, as scrambling would regularly generate non-V2 orders of the type shown below.

- (2) * Johann die Lebensmittel hat auf dem Markt gekauft.
 Johann the groceries has at the market bought.

This study has two primary goals. The first is to test this empirical generalization by means of an observational experiment, based on diachronic data from Yiddish. The history of Yiddish is a good experimental domain to test the proposed constraint,

¹I will not discuss the free word order phenomena of the Slavic languages, which present an apparent counterexample to the main proposal in this article. A full discussion of this topic would simply lengthen this already long article beyond all reasonableness. However, I would direct the reader to Bailyn (2003), where he presents arguments that the object fronting in Russian which is frequently termed “scrambling” in the literature is not the same syntactic operation as scrambling in the languages under discussion here.

²While the argument in this article does not depend on the idea that object shift is a sub-case of scrambling, the fact that the GHC applies to both phenomena does follow naturally if they are essentially the same operation, as argued in Richards (2004).

because the language underwent a phrase structure change which is predicted to interact with the GHC in a straightforward way: the headedness of TP changed from head-final (“Tense-final” phrase structure) to head-initial (“Tense-medial”). If the GHC is truly a universal, then it should interact with this change to restrict scrambling *immediately*, as soon as *any* Tense-medial phrase structure begins to show up in the language. The history of Yiddish is ideal for demonstrating this effect because first, the change only affected this one parameter, the headedness of TP, and so the prediction regarding the GHC is straightforward; secondly, the change is already well-described (Santorini 1989, 1992, 1993); and lastly, a diachronic parsed corpus is available for Yiddish over the relevant time period (Santorini 1997/2008), without which the above hypothesis could not be tested in any level of quantitative detail. As I will show, the GHC does indeed interact with the change in TP, and the hypothesis is confirmed at every observable level of detail.

Sections 2 and 3 introduce the facts about scrambling in Early and Modern Yiddish, respectively, and begin to make the case for the GHC as a descriptive generalization. Section 4 demonstrates two quantitative ways to test the GHC, and show that the GHC interacted with the changing phrase structure of Yiddish to restrict scrambling to below Tense in left-headed TPs. Section 5 shows that the change in Yiddish scrambling was indeed an effect of the GHC and not a loss of scrambling. Additionally, evidence from the history of English suggests that further phrase structure changes, in conjunction with the GHC, can turn a scrambling language into an object shift language of the Scandinavian type. Section 6 discusses the place of the GHC in the grammatical architecture, and argues that the GHC is actually a special case of a general LF interface requirement, the “Conservation of C-Command”. If this understanding of the GHC is correct, then it provides indirect evidence in support of some version of the Antisymmetry Hypothesis (Kayne 1994). Although the discussion up to section 6 will take place under a classical, head-parameterized phrase structure, I will ultimately conclude that the change in Yiddish is better understood under an antisymmetric phrase structure. Finally, I will conclude in section 7.

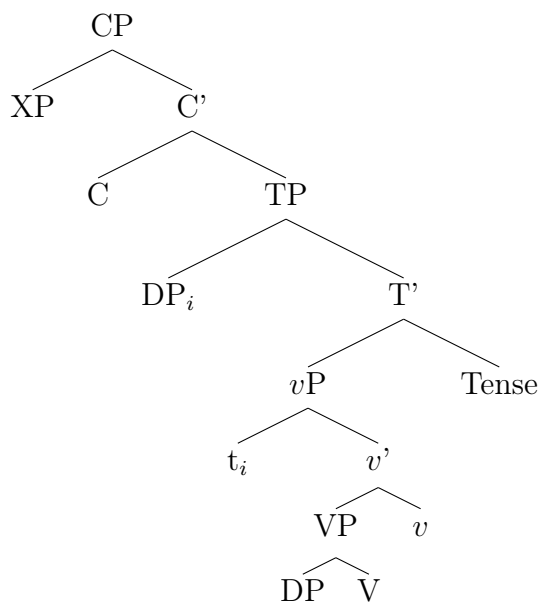
2 Scrambling in Early Yiddish

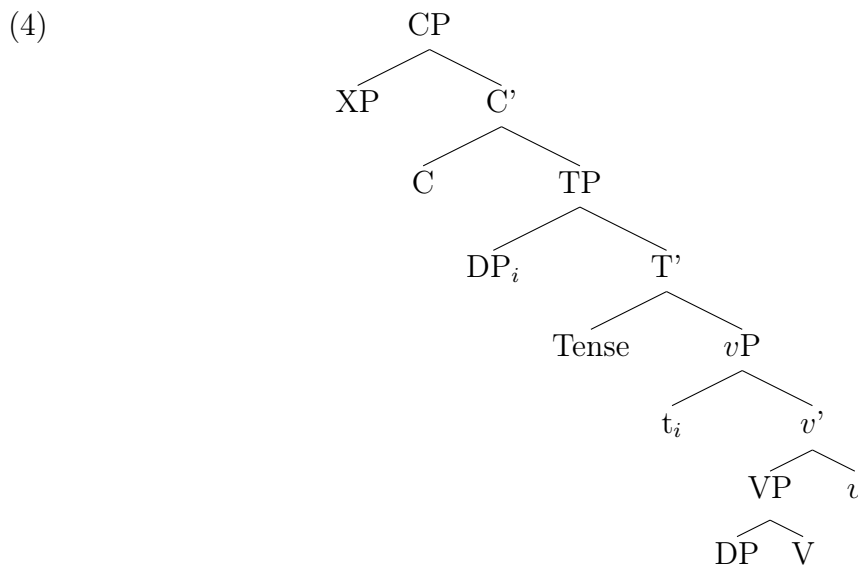
As Santorini (1992, 1993) showed, Yiddish gradually changed from a Tense-final language, like modern German or Dutch, into a Tense-medial language (or, a left-headed TP language, under classical X-bar theoretic assumptions) roughly between the years 1400-1800. After the change was initiated, Tense-medial TPs were introduced into the Yiddish speech community, and a period of variation began during which there was a mixture of both phrase structures in the speech community. That

is simply another way of saying that while the change was underway, there was a state of “grammar competition” among Yiddish speakers (in the sense of Kroch (1989) and much subsequent work): there were both Tense-final and Tense-medial TPs evident in the performance of the community and produced by individual speakers, who could alternate between the two structures even from sentence to sentence within the same text (see Santorini 1992, where this fact is established beyond doubt).

Ultimately, the frequency of Tense-medial TPs advanced at the expense of the older Tense-final system, until this natural evolutionary process resulted in the uniformly Tense-medial modern Yiddish. Under a classical X-bar phrase structure (where headedness is a matter of linearization in accordance with a “head parameter” setting), this would mean that Yiddish changed from (3) to (4) below. Note also that I will be assuming throughout this article that both Early and modern Yiddish are OV in the *v*P structure (contra Diesing 1997), and so the only diachronic issue is the position of Tense, as shown below. It is beyond the scope of this article to fully enter into the debate about the headedness of the Yiddish *v*P/VP, but see arguments in favor of the OV analysis in Geilfuss (1991), Vikner (2001), Haider (2005), Wallenberg (2009).

(3)





From the definition above, it should be apparent that the GHC predicts that such a change in Tense should have consequences for scrambling. Specifically, Tense on the right should allow objects to scramble to higher positions in the phrase structure than will Tense on the left.

Under its original German-like grammar, Yiddish showed Tense-final clauses with objects scrambled to various positions in the phrase structure. These include position within the vP , which I will take to be vP -adjoined, as well as scrambling to a higher, TP-adjoined position. Examples of Early Yiddish Tense-final subordinate clauses, such as those in (5)-(7), demonstrate that objects (in boldface below) scrambled to a landing site above the canonical subject position and immediately adjacent to C, just as they do in modern German.³ This type of scrambling behavior, where objects are able to scramble up to the only head on the left but not past it, is exactly what the GHC predicts for Early Yiddish (or modern German), given a structure like the Tense-final one given in the preceding section.⁴

³The objects in these examples are object pronouns, presumably unstressed and phonologically weak. This is simply because weak pronouns are the type of object which is most likely to scramble in Yiddish, as in German (see Cardinaletti and Starke 1995, for more discussion). However, it is important to note that full, nominal DPs can also scramble to the same positions as pronouns in both modern and Early Yiddish, under appropriate information-structural and phonological conditions.

⁴A note on the Yiddish transliteration: in general, I follow the transcription in Santorini (1997/2008). For modern Yiddish sentences, this means following YIVO romanization practice. For Early Yiddish, I follow the transcription in Santorini (1997/2008), so that my examples can be searched for in the *Penn Yiddish Corpus*.

- (5) zeyt gibetin d[a]z **mir** eyer fatr moykhl iz
 be requested that me-DAT your father forgive is
 “Be requested that your father forgives me”
 (letter in Weinryb 1937, date: 1588)
- (6) ...d[a]z **mir** yusf di h’ zhubim nit gebn vil
 that me Joseph the five guilders not give wants
 “that Joseph doesn’t want to give me the five guilders”
 (Court Testimony, date: 1465; also cited in Santorini 1992)
- (7) d[a]z **es** unzr her gut oyz ginumn hut far an
 that it our Lord God out took has presently
 “...that our Lord God has made a success of it presently”
 (Leib bar Moses Melir’s *Book of Esther*, date: 1589)

It is important to note that all of these examples are unambiguously Tense-final, as determined by the presence of some diagnostic element in the sentence, and it is only possible to generalize about the scrambling system of the old Tense-final Yiddish grammar by using such diagnostics. As Santorini (1992, 1993) discusses, many of the clauses in the Yiddish historical data during the period when the position of Tense was changing are ambiguous and could be surface representations of either underlyingly Tense-medial or Tense-final clauses, and so it is necessary to rely on the presence of certain diagnostic elements in order to determine whether a given clause is Tense-medial or Tense-final. These diagnostic elements include sentential negation (as in 6) and verbal particles (i.e. Germanic separable prefixes, as in 7) including *loshen koydesh* elements⁵ as in (5), both of which only occur preceding a finite verb in Tense-final clauses and following a finite verb in Tense-medial ones. (See also Kroch and Taylor 2000; Pintzuk 1991, 2005; Pintzuk and Haeberli 2006; Pintzuk and Taylor 2006, regarding the use of such diagnostic elements.) Pronominal objects, which do not participate in extraposition constructions due to their light prosodic status, are also diagnostic of a Tense-medial clause when they follow a finite verb.

In each of the subordinate clauses above, a weak object pronoun has scrambled to surface between the complementizer and the subject, in a position that is plausibly clause-adjoined under the standard assumption that the subject has moved to

⁵Certain elements that were borrowed from Hebrew and form predicates when combined with German light verbs, such as *khasono hobn* (= “to get married”, lit. “marriage have”) or *moykhel zeyn* (= “to forgive”, lit. “forgive be”). These have the syntax of native Germanic particles in Yiddish; see Santorini (1989), Santorini (1992).

Spec(TP).⁶ However, it is possible to pinpoint the position of the scrambled element more definitively with the help of examples such as (6) above. In (6), the subject *yusf* appears to the left of sentential negation (and indeed, to the left of another object – a fact I return to below). Under the assumption that sentential negation appears to the left of *vP*⁷, the subject must have moved out of its base position (to the right of negation), either to some specifier above negation, i.e. Spec(TP) in the classical phrase structure above, or by scrambling itself. If this is correct, then the scrambled pronoun must occupy an even higher structural position, which I will assume to be TP-adjoined for purposes of the present discussion. Another example of this type is (8) below:

- (8) dz es di mtsreym nit zaltn zehn
 that it the Egyptians not should see.
 “...that the Egyptians shouldn’t see it”
 (Leib bar Moses Melir’s *Book of Esther*, date: 1589)

Here again, the subject *di mtsreym* has moved to the left of sentential negation, *nit*, and the object pronoun *es* has moved farther to land in the TP-adjoined position. It is also crucial that the subject in this example is definite, as is the case in all of the preceding examples (5)-(8). It is well known that all attested Germanic languages demonstrate some version of the “definiteness effect” (Diesing 1992; Haerberli 2000, 2002; Haider 1993; Keenan 1987; Rögnvaldsson 1984, *inter alia*), where subjects can only remain in their base position within the *vP* if they are indefinite. Definite subjects (and all definite arguments, according to Diesing 1992) must at the very least exit the *vP*, and so in addition to the evidence of pure word-order above, there is a strong semantically motivated reason to believe that both the subjects and the scrambled objects in examples (5)-(8) have moved to positions above the *vP* (contra the claim in Haider and Rosengren 2003, that scrambling does not leave the VP). Note that modern German, a living, uniformly Tense-final language, shows exactly the same scrambling system as the Tense-final clauses from Early Yiddish, including

⁶Our understanding of the subject position will be revised in section 6.3, but at this point in the argument, the important point is that scrambling can target a position above the canonical position for definite subjects in Early Yiddish (e.g. even when the subject precedes adverbs and negation). However, it is an important point that both definite and indefinite subjects may appear in lower positions in modern German and some other Germanic varieties (Haider 1993; Haerberli 1999; Bobaljik and Wurmbrand 2005).

⁷I do not take a stand on the exact position and status of negation in early Yiddish at this time. For present purposes, it is only important that negation scopes over the whole event, i.e. the lexical verb and its arguments, including the position in which the external argument initially merges

the placement of the subject and adverbs, as shown by German subordinate clauses such as those below.

- (9) Ich weiss [dass **das Buch** Johann gestern nicht gekauft hat].
 I know that the book Johann yesterday not bought has
 “I know that John didn’t buy the book yesterday”

Clauses like (6) above also clearly show that early Yiddish had scrambling to multiple landing sites at different levels of the structure. As I mentioned above, the position of sentential negation *nit* signals the left edge of *vP*, and so both the indirect object, *mir*, and the direct object, *di h’ zhubim* (“the five guilders”) must have scrambled out of their base object positions. The fact that the subject *yusf* can occur between the two scrambled objects plainly shows that there were at least two landing sites for scrambling in early Yiddish. Additionally, clauses like the one in (10) provide evidence that these two scrambling positions in early Yiddish were indeed TP and *vP*.

- (10) Vi mir **das kinigreykh fun hkb"h un zeyn yokh** oyf uns antpfngn
 how we the kingdom of God and his yoke on us accepted
 habn
 have
 “...how we accepted upon ourselves the kingdom of God and his yoke”
 (Isaac ben Aaron Prossnitz’s *Preface to Sefer Shir ha-Shirim*, date: 1579)

In this sentence, both the subject and object appear to the left of the *vP*-modifying PP *oyf uns* (“on us”). The 1pl subject pronoun, *mir* (not to be confused with the homophonous 1sg dative pronoun) is high in the structure in the TP domain (e.g. Spec(TP)); indeed, in addition to the fact that pronouns are definite, Haerberli (2002) argues that subject pronouns in Germanic never remain in a low subject position, even when such a position is available for other definite subjects. The object, *das kinigreykh...* (“the kingdom...”), on the other hand, has scrambled from its base position past the *vP*-adjoined PP, but not as high as the surface position of the subject. This type of example is further confirmation that there was a lower landing site for scrambled objects in early Yiddish, as well as the higher one seen in examples like (8). Again, this behavior in Early Yiddish is exactly parallel to the behavior of modern German, as shown in example (9) above and (11)-(13).

- (11) Ich weiss dass Johann gestern nicht **das Buch** gekauft hat.
 I know that Johann yesterday not the book bought has.

- (12) Ich weiss dass Johann gestern **das Buch** nicht gekauft hat.
 (13) Ich weiss dass Johann **das Buch** gestern nicht gekauft hat.
 “I know that John didn’t buy the book yesterday.”

(with contrastive, or at least, narrow focus on *das Buch* in 11, but not in examples 12 and 13)

Both the *vP*-adjoined landing site and the *TP*-adjoined landing site are consistent with the descriptive generalization about scrambling, the GHC, stated in section 1 above; the constraint only specifies a structural upper bound on scrambling given a particular phrase structure (C, in the case of Early Yiddish and German), but lower landing sites are also predicted to be possible by the GHC. In this light, it is also expected that there should be, in principle, no upper bound on scrambling given a clause structure that is entirely head-final. Evidence from a different language family confirms this: scrambling in Japanese and Korean is well-known to be unbounded in principle (“long-distance scrambling”, as it is called in Lee 1993; Saito 1992; Saito and Fukui 1998), subject only to processing constraints. The examples in (14)-(16) show that objects in Japanese can scramble to escape clause boundaries, landing at the left edge of the matrix clause.

- (14) Bill-ga Mary-ga John-ni sono hon-o watasita to itta (koto)
 Bill-NOM Mary-NOM John-to that book-ACC handed that said (fact)
 (15) **Sono hon-o John-ni** Bill-ga Mary-ga watasita to itta (koto)
 that book-ACC John-to Bill-NOM Mary-NOM handed that said (fact)
 (16) **John-ni sono hon-o** Bill-ga Mary-ga watasita to itta (koto)
 John-to that book-ACC Bill-NOM Mary-NOM handed that said (fact)
 “Bill said that Mary handed that book to John.”
 (Saito and Fukui 1998, 443-444)

The in situ order for a sentence containing an embedded complement clause is shown in (14) above. In (15) and (16), both of the embedded objects, the direct object *sono hon-o* and the indirect object *John-ni*, have scrambled leftward out of their original clause to the left of the matrix subject, *Bill-ga*. Sentence (16) demonstrates that the objects may be freely reordered in their scrambled positions, suggesting that the objects do not land in particular specifier positions in the matrix clause, but rather adjoin at a high phrasal node and can freely extend the structure with further adjunction. Note that the possibility of scrambling multiple embedded XPs

to the left of the matrix subject rules out any analysis of this phenomenon as cyclic topicalization. (There is also no upper bound on the number of objects scrambled out of embedded clauses to this high adjunction position, apart from general processing constraints; see Saito and Fukui 1998, 444, footnote 8, for examples of up to four long-scrambled objects.) Under the theory being developed here, this behavior is not exceptional at all. So-called “long-scrambling” is just the interaction of canonical scrambling, as found in German, with the C-final (and wholly head-final) phrase structure of Japanese and Korean (for parallel examples in Korean, see the extensive study of Korean scrambling in Lee 1993, and arguments for scrambling as adjunction). In contrast, German does not allow scrambling out of a subordinate clause, as its CP is C-initial rather than C-final:⁸

- (17) * Ich weiss **das Buch** dass Johann gestern nicht gekauft hat.
 I know the book that Johann yesterday not bought has.

The data from Japanese and Korean lends further weight to the idea that there is a general constraint on scrambling, the GHC, and that scrambling languages are expected to scramble objects as high as possible as long as they do not violate the GHC. In this way, the Early Yiddish data not only tells us that there were (at least) two positions for scrambled objects, TP-adjoined and *v*P-adjoined, but it also falls into a larger pattern: scrambling is an operation which is defined in general terms (e.g. “scrambling adjoins to maximal projections”), and its scope of application is a purely derivative notion that is derived from how the GHC interacts with the

⁸Examples such as (17) are ungrammatical in all varieties of German, to my knowledge, under a structure where the DP lands in a position to the left of the complementizer by the scrambling operation that this article discusses. However, speakers of Bavarian German do produce strings like the one in (17) by a different operation, as discussed in Bayer (1984):

- (1) An Mantl daß da Xaver kaffd hod hod neamt glaubt
 A coat that the Xaver bought has has nobody believed
 “Nobody believed that Xaver bought a COAT”
 (Bayer 1984, 213)

Bayer analyzes this construction, correctly in my opinion, as topicalization of the DP *An Mantl* to the embedded Spec(CP), not as scrambling into the matrix clause. Such an analysis is particularly plausible given the accented (and probably contrastive) nature of the DP, as indicated in Bayer’s translation. Note that among other things, scrambling has the feature of de-accenting the scrambled DP, as discussed later in subsection ?? below, and this is also a characteristic of the scrambling past C found in Japanese. Thus, sentences such as (1) in Bavarian should not be counted as counterexamples to the generalization that scrambling past C is impossible in left-headed-CP languages.

particular clause structure of the language in question. This also goes against the assumption in Haider and Rosengren (2003) and Haider (2005) that scrambling is always adjunction to VP. Either that hypothesis is trivially false, or Haider and Rosengren (2003) have to assume that cross-clausal scrambling as in Japanese is some independent phenomenon and not the same scrambling operation that is found in German. Under that latter view, the fact that the potential distance of scrambling is predictable from the headedness of the phrases along the clausal spine in both the German/Early Yiddish case and the Japanese/Korean case, as well as modern Yiddish as I will show in the next section below, is treated as just a coincidence.

Under the account developed here, on the other hand, these facts all follow from a general principle, the GHC. Furthermore, the GHC has quite a lot of additional empirical coverage in that it subsumes the better known Holmberg’s Generalization, and so additionally predicts the upper structural bound of Scandinavian object shift (and Middle English / Early Modern English object shift, as shown in Wallenberg 2008, 2009).

3 Scrambling in Modern Yiddish

As Yiddish changed over time from a German-style Tense-final clause structure to a Tense-medial clause structure, objects became trapped in a lower structural position due to the presence of the finite verb in Tense at the left of the object’s initial merge position. Just as the GHC predicts, Tense is a barrier to scrambling in modern Yiddish and objects can no longer move to the high scrambling position adjacent to C, with one notable exception (discussed below). This is in contrast to the Early Yiddish scrambling system described above, where Tense was not a structural barrier to scrambling, apparently only because it was at the right edge of the TP rather than the left. The new and lower ceiling on scrambling in modern Yiddish can be seen clearly by comparing the German sentences above to the parallel modern Yiddish sentences in (18)-(23).⁹

- (18) Ikh trakht az Hayim hot **dem bikhl** nekhtn nit gekoyft.
I think that Hayim has the book-DIM yesterday not bought
- (19) Ikh trakht az Hayim hot nekhtn **dem bikhl** nit gekoyft.
I think that Hayim has yesterday the book-DIM not bought.
“I think that Hayim didn’t buy the book yesterday.”

⁹Modern Yiddish examples and judgments which are not attributed above are due to my informant, Abraham Zeif, a native speaker of Lithuanian Yiddish

- (20) Ikh trakht az Hayim hot **im** nekhtn nit gekoyft.
I think that Hayim has him yesterday not bought
- (21) Ikh trakht az Hayim hot nekhtn **im** nit gekoyft.
I think that Hayim has yesterday him not bought.
“I think that Hayim didn’t buy it yesterday.”
- (22) * ... az {**im**, **dem bikhl**} Hayim hot nekhtn nit gekoyft.
... that {him, the book} Hayim has yesterday not bought
- (23) * ... az Hayim {**im**, **dem bikhl**} hot nekhtn nit gekoyft.
... that Hayim {him, the book} has yesterday not bought

Once the change to Tense-medial phrase structure was completed in Yiddish (by the beginning of the 19th century, if not earlier), subordinate clauses uniformly placed tensed verbs on the left of the clause immediately after the canonical subject position. Just as in Tense-final Early Yiddish, modern Yiddish allows the scrambling of nominal objects (as in 18-19) or pronominal objects (20-21) to both higher and lower positions in the phrase structure (compare 18 to 19, and 20 to 21). However, the upper structural bound on scrambling in modern Yiddish is lower than it was in Tense-final Early Yiddish, and so the highest possible scrambling position in modern Yiddish is still below the Tense domain, not above Tense as it was in Early Yiddish. As the examples above show, it is no longer possible in modern Yiddish to scramble objects to the left of the canonical subject position adjacent to C as in modern German and Early Yiddish (see 22), or to any position left of the finite verb (as in 23). This change in the behavior of scrambling is entirely expected under the GHC: in reality, the scrambling system did not change at all, but the change in the structure of the TP caused scrambling to become more restricted.

However, there is exactly one environment in which scrambling can proceed to positions higher than Tense in modern Yiddish. This exception to Tense’s blocking of scrambling is one of the most important pieces of evidence showing the existence of the GHC, and it demonstrates that in other respects, the Yiddish scrambling system remained unchanged over the course of Yiddish’s history. It is true that the change to Tense-medial restricted scrambling to landing sites below Tense in subordinate clauses (the data set I consider below in the quantitative study), but this is something of a simplification where matrix clauses are concerned. In root clauses, where V-to-(T-to-)C movement is a possibility, scrambling is restricted to below Tense only when the tensed verb surfaces in Tense at the end of the derivation. On the other hand, in contexts where the finite verb moves to C (i.e. Tense is attracted to C), an object can scramble as high in modern Yiddish as it could in earlier stages of the language.

When the Tense barrier to scrambling has itself moved higher, to C, objects can still scramble to TP-adjoined position and cross the subject.

The high scrambling position is shown in the following matrix clauses, all written in the 20th century (more than a hundred years after any potentially Tense-final examples can be found in even highly literary texts). Note also that *Royte Pomerantsen*, the text in which examples (24), (25), and (27) occur, was written as a compilation of stories reflecting colloquial Yiddish as the author heard it (see the introduction in Olsvanger 1947), and so it is unlikely that these sentences represent an archaism of some kind or a feature of a formal register.

- (24) hot **dos** di rebetsn nit gekent hern
 has that the rebbetzin not could hear
 “The rabbi’s wife wasn’t able to hear that. [she couldn’t stand to hear it]”
 (Olsvanger 1947, *Royte Pomerantsen*, date: 1947)
- (25) Hot **im** der rebe gegeben an eytse,
 Has him-DAT the rabbi given a piece-of-advice,
 “The rabbi gave him some advice, ...”
 (Olsvanger 1947, *Royte Pomerantsen*)
- (26) farvos zoln **zikh** yidn glat krign?
 why should REFL Jews in-general fight
 “Why should Jews always fight amongst themselves?!”
 (Perets Hirshbeyn’s *Grine Felder*, date: 1910)
- (27) nu, iz vos hot **aykh** der fish geentfert?
 So, Q what had you-DAT the fish answered
 “So what did the fish say back to you?”
 (Olsvanger 1947, *Royte Pomerantsen*)

This enlarging of the scrambling domain by V-to-C movement is the same phenomenon as the Scandinavian object shift facts that originally led to Holmberg’s Generalization (Holmberg 1986), where the movement of finite lexical verbs to C in Scandinavian varieties licenses object shift. In fact, object shift across a subject can also be licensed by V-to-C in Swedish (Josefsson 1992), producing surface orders very much like the modern Yiddish ones below. The fact that this behavior persists in modern Yiddish shows that nothing has changed in the history of Yiddish concerning the scrambling operation itself: the high, TP-adjoined position for scrambled

objects was never lost. Rather the GHC simply asserts itself in a larger set of contexts in Tense-medial modern Yiddish (e.g. subordinate clauses) than it did under the old Tense-final phrase structure, because Tense is more often in a position to block leftward scrambling.

Each of the sentences in (24)-(27) contains not only a scrambled object to the left of the subject, but also some context which is independently established as a V-to-C trigger across Germanic. The first two sentences above are narrative V1 sentences, generally taken to result from V-to-C movement triggered by an appropriate information-structural context; this is presumably encoded in the syntax as a feature on C and an empty operator in Spec(CP) (see Besten and Moed-van Walraven 1986 on Yiddish, Thráinsson 1986 on Icelandic, and Kroch and Taylor 1997 as well as references cited there on the set of V-to-C contexts in Old English). The last two sentences, (26) and (27), are verb movement triggered by *wh*-movement, an uncontroversial V-to-C trigger cross-linguistically (for languages which are not *wh*-in-situ, of course). Thus, the object scrambling in these cases is clearly licensed by V-to-T-to-C movement, regardless of whether one accepts the claim in Diesing (1990) that finite verbs in modern Yiddish typically remain low in Tense even in many root contexts. Of course, scrambling is also present in these more canonical V2 contexts, as in (28) below, which would either be licensed by V-to-T or by V-to-T-to-C movement, depending on one's analysis of Yiddish V2:

- (28) az got zol voynen oyf der erd, voltn **em** di mentshn di fentster
 that God should live on the Earth, would him the people the window
 oysgeshlogn.

break

“If God lived on Earth, people would break his windows.”

(Olsvanger 1947, *Royte Pomerantsen*)

Furthermore, examples (24) and (26) provide additional evidence from the position of the subject that the object has scrambled past the original position of Tense, following the incorporation of the verb with Tense and subsequent movement to C. In example (24), the subject appears to the left of sentential negation, *nit*, which could not possibly be occupying a position any lower than the left edge of the *v*P projected by the auxiliary *gekent* (“could”); note that this must be true independently of how one analyzes the order of the nonfinite verbs here, since the negation clearly scopes over the modal in context. The position of negation must be higher than the base position of the subject, and it may in fact be in a higher position than the left edge of *v*P. This indicates that the subject, *di rebetsn* (“the rabbi’s wife”), has moved to Spec(TP), and the object, *dos* (demonstrative “that”) has scrambled

above Spec(TP), just as in the Early Yiddish subordinate clauses I discussed in the section above. In the same way, the subject *yidn* (“Jews”) in (26) appears to the left of the adverb *glat* (“in general”, “always”), which clearly has scope over the whole event including the agent. Thus, the subject has moved out of *vP* and plausibly to Spec(TP), and the object *zikh* (the reflexive) must have scrambled out of TP. The position of the subject in these cases also makes it certain that the verb has raised higher than Tense, especially as the subject is definite in (24), (25), and (27). Therefore, given standard assumptions about verb movement in Germanic (including modern English), it is definitely V-to-C movement that has licensed the high landing site of object-scrambling in these cases.

The V-to-C examples show two key aspects of the way the basic clause structure interacts with scrambling in Yiddish: first, that the GHC is constant over the history of the language, and simply asserts itself depending on where heads along the clausal spine are placed according to independent syntactic concerns, and secondly, that the high TP-adjoined landing site for scrambling never left the language, but merely became more restricted in where it could surface because of independent changes in the rest of the phrase structure.

4 Phrase Structure Variation and Change

The contrast between Tense-final Early Yiddish and Tense-medial modern Yiddish that I described in sections 2 and 3 is the expected effect of the change in the position of Tense on scrambling, according to the GHC. However, the GHC actually makes a much stronger prediction beyond what can be seen from a bird’s-eye look at the overall diachronic trajectory of Yiddish. In addition to predicting the modern state of scrambling in the language, the GHC also makes the finer-grained prediction that scrambling should be restricted to positions below Tense in every Tense-medial clause, at any time during or after the change in phrase structure, and regardless of the overall frequency of Tense-medial vs. Tense-final clauses in the population at a given time. Using a parsed diachronic corpus of Yiddish (the *Penn Yiddish Corpus* Santorini 1997/2008), this hypothesis can be tested in two ways: the first, the demonstration of a categorical property of Yiddish during its change in progress, is presented in section (4.1). The second is a statistical pattern, presented in section (4.2) below. Note that all of the data below is taken solely from subordinate clauses, as in Santorini (1992, 1993), since even Tense-final Yiddish matrix clauses were V2, exhibiting general verb movement to C as in German (following the standard analysis of West Germanic V2 going back to den Besten 1983).

4.1 Evidence from Unambiguous Clauses

First, as I argued above the analysis of individual example sentences is sufficient to demonstrate that early Yiddish had (at least) two potential landing sites for scrambled objects, adjoined to *vP* and adjoined to TP. During the time period when the change to Tense-medial was in progress, both Tense-final and Tense-medial TPs were produced by speakers and recorded in the texts that make up our data set. Without any *a priori* knowledge about how scrambling is restricted, one might make the maximally simple prediction that the position of Tense in a given clause and the position of a scrambled object in a given clause are entirely independent of each other. If this were the case, then during the period of variation as the change in Tense was progressing, we would expect to see (subordinate) clauses of the following 4 types, i.e., all of the logical combinations of the possibilities for scrambling and for the position of Tense:

1. Tense-final, scrambling to *vP*-adjoined position
2. Tense-final, scrambling to TP-adjoined position
3. Tense-medial, scrambling to *vP*-adjoined position
4. Tense-medial, scrambling to TP-adjoined position

In statistical terms, if any of the four combinations above were significantly over-represented or underrepresented in the Yiddish data set, it would call into question the independence of scrambling and the position of Tense. However, the GHC actually makes the more ambitious prediction that pattern #4 should be completely absent.

As it turns out, this is indeed the case: scrambling above Tense is entirely unattested in unambiguously Tense-medial clauses; while combination #2 is well-represented, combination #4 is impossible. As I mentioned above, due to the frequent use of extraposition in historical Yiddish and German, the majority of clauses in the corpus are ambiguous, in principle, and could have been generated by an underlying Tense-medial or Tense-final structure (e.g., the configuration **Subject** > **finite-lexical-verb** > **Object** could represent a Tense-medial clause or a Tense-final clause with object extraposition). In order to address this issue, Santorini (1989) demonstrated that certain light elements do not extrapose in Yiddish (see also the other studies above for other Germanic varieties). The following set of diagnostics

signal that the finite verb has unambiguously moved to a medial Tense head: negation¹⁰ following the finite verb, verbal particles (separable prefixes) following the finite verb, and object pronouns following the finite verb. On the other hand, pre-finite-verb negation and particles are diagnostic of underlying Tense-final structure, as in examples (5)-(8).¹¹

In Table 1, I show the frequency of objects preceding the finite verb in clauses with one of the above diagnostics for the position of Tense and a subject preceding the finite verb. Note that “Vfin” refers to a finite auxiliary or lexical verb, except for the particle case: only clauses with finite lexical verbs were counted for the particle diagnostic, since the configuration with an auxiliary, **Aux** > **particle** > **V** is perfectly acceptable in modern Tense-final verb(-projection)-raising languages like modern Dutch and so may constitute an underlyingly Tense-final clause. Clauses with auxiliaries were included for the negation case, following Santorini (but see footnote 14).^{12,13}

¹⁰This category also includes a few light adverbs, e.g. *shoyn* (“already”) that are annotated by Santorini in the corpus as being diagnostic like negation.

¹¹I cannot, of course, assume a priori that preverbal object pronouns are diagnostic of Tense-final structure, since the hypothesis I am out to test is whether or not any objects can move across medial Tense. However, weak object pronouns following the finite verb are diagnostic of Tense-medial structure, as these elements are too prosodically light to extrapose in Germanic.

¹²The condition on the position of the subject is intended to exclude examples in which an object has been topicalized to the left of the finite verb in an embedded clause, rather than scrambled. It is a well-known fact of modern Yiddish that embedded clauses allow topicalization with V2 (cf. den Besten and van Walraven 1986; Diesing 1990), and topicalized objects are not relevant to the discussion of scrambling.

¹³The “16” in the table is in parentheses because, as I mentioned above, I cannot assume that a preceding pronoun is diagnostic of Tense-final structure since this precisely the hypothesis I’m testing. Also, I have excluded one obvious scribal error (for which the translation is obscure, in addition) from consideration:

- (1) vi **mir** hrab”d zi”l hut **mir** lkhumin eyn giroymt
 how me-DAT the Rabbi D. of-blessed-memory has me-DAT nothing?? granted
 “...how Rabbi D., of blessed memory, has granted me nothing(?)”
 (West Yiddish court case, date: 1665)

The sentence in (1) is certainly not a relevant example, since the two instances of *mir* are not actually two objects, but rather one repeated for reasons that are unclear. The resulting sentence is ungrammatical in Yiddish and German, and the author/copyist clearly meant to write only a single *mir*. Of course, whether the *mir* was originally intended to occur before or after the auxiliary is impossible to determine.

[Insert Table 1]

The column of zeroes¹⁴ in the center clearly shows the effect of medial Tense on TP-adjoined scrambling: as far as we can tell, it is categorically disallowed in Tense-medial clauses.

On the other hand, when the relevant diagnostics precede the finite verb, showing the clause to be Tense-final, there are 48 examples of objects also preceding the finite verb. Below are further examples of the diagnostic patterns which we find in early Yiddish; the first two clauses below in (29)-(30) contain the verb-particle Tense-final diagnostic, and then (31) and (32) contain the negation Tense-final diagnostic. (The diagnostic is italicized in examples (29)-(31) and the scrambled object is in boldface.)

¹⁴ This number excludes 2 examples that have negation following a finite auxiliary and preceding a nonfinite lexical verb which are most likely examples of negation trapped by verb-projection-raising (of the West Flemish or Swiss German type), from a Tense-final structure, rather than actual Tense-medial clauses. In these examples, the scope of negation is most likely not sentential, but rather over the nonfinite verb alone; this is consistent with the fact the verb-projection-raising creates a scope island in the raised projection (Haegeman and van Riemsdijk 1986; Kroch and Santorini 1991; Haerberli and Haegeman 1998). The examples are given in (1)-(2) below:

- (1) ven er **zikh** shun hut nit gimiat dribr...
 If he REFL already has not had-trouble there-over
 “If he hadn’t already had trouble with it...”
 (Preface to Jacob ben Isaac Rabbino Ashkenazi’s *Sefer ha-Magid*, date: 1600)

In (1), the scope of negation is ambiguous, as it generally will be in a past perfect sentence. However, the placement of the adverb *shun* before the auxiliary makes it very unlikely that this sentence is Tense-medial (this sentence is ungrammatical in modern, Tense-medial Yiddish), and so I assume that the negation scopes low.

- (2) ...dz mn **mikh** fr eyn krbn vil nit bgerin
 that one me for a martyr wants not desire
 “[what kind of sinner must I be] that people want to not desire me as a martyr”
 (The Vilna blood-libel case of 1690, date: 1692)

In this case, the context makes it likely that the scope of negation is over *bgerin* (“desire”): this sentence occurs in a story in which a community makes a choice to redeem a prisoner against his will, and so it seems that the emphasis is on the community willingly ignoring his desire to be a martyr. But independent of the scope facts, the presence of the PP *fr eyn krbn* (“for a martyr”) preceding the auxiliary makes it almost certain that this clause is Tense-final; this sentence would not be possible in modern Yiddish, nor would it be possible in other modern Tense-medial languages with V-to-T movement (e.g. Icelandic).

- (29) ...das ikh **im** ab zag
 that I him off spoke
 “that I refused him”
 (Götz fun Fiderholtz’s Complaint, date: 1518)
- (30) ven ir **mir** meyn zun *um* brengt
 if you me-DAT my son around bring
 “if you kill my son”
 (*Magen Avraham*, date: 1624)
- (31) meyn kleydr hut er mir vr koyft di er **mir** nit hut gimkht
 my clothes has he me-DAT sold which he me-DAT not has made
 “and he sold me clothes that he hadn’t made for me”
 (Court Testimony, date: 1465)

Note that in (31), the order of auxiliary and nonfinite verb in the relative clause is the same that a Tense-medial clause would have, but in this case, the diagnostic makes it clear that this is an instance of a Tense-final clause with the West Germanic Verb Raising construction (as in Dutch, West Flemish, or Swiss/South German). It is for this reason that I could not include the relative order of verb and auxiliary as a Tense-medial diagnostic in Table 1. Example (32) below, on the other hand, also shows the negation diagnostic, and additionally it has the expected order of verb and auxiliary for a Tense-final clause. (Note that this example also shows PP-extraposition, a commonly exercised option even in early Yiddish Tense-final clauses, as I mentioned above.)

- (32) dz mn **di yungin** in ir yugnt nit givint hut tsu keynn
 that one the youngsters in their youth not accustomed has to no
 peulut
 occupation
 “...that one hasn’t accustomed the young people to any occupation in their youth”
 (Anshel ben Joseph’s *Preface to the Hebrew-Yiddish Bible Concordance*, date: 1534)

To reason a bit more precisely about the distribution of objects and diagnostic elements, we can use a simple statistical model (Pearson’s chi-square) to quantify exactly how unlikely the row of zeroes in Table (1) would be if there were no constraint

against scrambling across a medial Tense head. In the tables below, I estimate the number of examples we would expect to find (given a dataset of this size) with an object to the left of a finite verb in unambiguously Tense-medial clauses, under the assumption that object position is independent of the position of a Tense-medial/Tense-final diagnostic.¹⁵ As should be apparent from the expected distributions below, the independence model fits very badly both to the observed distribution for objects and particle diagnostics ($\chi^2 = 63.0$ on 1df, $p = 2.06 \times 10^{-15}$) and to the observed distribution for objects and the negation diagnostic ($\chi^2 = 158$ on 1df, $p = 2.20 \times 10^{-16}$).

[Insert Table 2]

[Insert Table 3]

In summary, there must be an interaction between the choice of a given clause structure (Tense-medial vs. Tense-final), which the diagnostics represent, and the position of a scrambled object. But what we have observed is far more than a statistical interaction effect; it is categorical. If an object originates to the right of Tense, it cannot scramble to a hierarchical position above Tense. Thus, the gap in the historical data corresponds to the negative judgments shown above in (22) and (23) from speakers of modern Yiddish.

4.2 Evidence from Ambiguous Clauses

As I mentioned above, much of the data in the corpus of historical Yiddish is ambiguous as to the position of Tense, and so it is not possible to test the validity of the GHC in as direct a way as we did in the previous section with the remainder of the available data. Fortunately, it is possible to use statistical methods to test the GHC quantitatively using the ambiguous data in the corpus. We will see below that

¹⁵In case readers feel that the independence assumption is too strong, this does seem to be the correct statistical prediction based on Diesing (1997)'s account of modern Yiddish scrambling. Diesing argues that scrambling moves objects across the nonfinite verb in modern Yiddish from an underlying VO position, and she argues that the objects move to the same landing sites as in modern German and for the same semantic and information-structural reasons. If the movement is no more difficult across the verb than it is in an underlyingly OV language, and if the movement occurs for the same reasons as in an OV language, then it follows that it should occur at the same frequency as in an OV language. This section simply extends this analysis to Tense in Early Yiddish, arguing that if scrambling across a head were not an issue, objects should be found in the same positions in Tense-final and Tense-medial Yiddish (presumably until the scrambling is restricted at a later time for some independent reason).

it is possible to construct a kind of observational experiment which compares some of the ambiguous data in the corpus to a set of unambiguous clauses from the corpus, and test a quantitative hypothesis which links the GHC to a particular statistical pattern, the Constant Rate Effect. We will show that the hypothesis is supported by the results of the experiment below, which provides a different type of confirmation that the GHC exists as a constraint throughout the history of Yiddish.

Aside from clauses with the diagnostic elements listed above, the only other unambiguous clause type in the corpus (i.e. unambiguous without making reference to object position) are clauses with auxiliaries and the order, **nonfinite-lexical-verb** > **finite-auxiliary**, which are unambiguously Tense-final regardless of object placement (see e.g. 7, 6, 10, 32 above). In contrast, most clauses during the period of phrase structure change in Yiddish are stringwise ambiguous between Tense-medial and Tense-final from the point of view of a modern analyst reading the texts.¹⁶ The remaining types of clauses have an auxiliary and the order, **Aux** > **V**, as in the subordinate clauses below, which could in principle be either Tense-medial, or Tense-final plus the West Germanic Verb (Projection) Raising construction, or V(P)R (Zaenen 1979; Haegeman and van Riemsdijk 1986):

- (33) ...zi zal eydes zagn
 she should testimony say
 “She should give testimony”
 (West Yiddish court case, date: 1565)

- (34) dz shlmh hmlkh eliu hshlum hat shir hshirim gimkht
 that Solomon the-king peace-be-upon-him has Song of Songs made
 “...that Solomon The King, peace be upon him, wrote The Song of Songs”
 (Isaac ben Aaron Prossnitz’s *Preface to Sefer shir ha-shirim*, date: 1579)

And finally, there are clauses with a finite lexical verb and no auxiliary; these contain no hint to their underlying structure, minus any information about how object scrambling is constrained (i.e. without the GHC, the clause in (35) must be considered as ambiguous as the clause in (36)).

¹⁶Note that not all of the “ambiguous” clauses would have been truly ambiguous to Early Yiddish speakers, or to a child acquiring Early Yiddish, as there might have been prosodic cues to DP extraposition (cf. e.g. Kroch and Pintzuk 1989, who argue that DP extraposition across a tensed verb in Old English Tense-final clauses required an intonational boundary following the tensed verb). However, there do not seem to be prosodic cues to Verb Projection Raising (see below), if modern varieties like Dutch, Afrikaans, or Swiss German are a guide.

- (35) ven mn eynm kind afilu gibr eyn shtuk brot
 if one a child even gives a bit bread
 “if one even gives a child a piece of bread.”
 (Isaac ben Aaron Prossnitz’s *Preface to Sefer shir ha-shirim*, date: 1579)

- (36) dz zi lubn hkbh
 that they praise God
 “that they praise God” (Isaac ben Eliakum’s *Preface to Lev Tov*, date: 1620)

The potentially ambiguous clause types cannot be directly used to answer the question of whether the change in the position of Tense had an effect on scrambling. However, we can make indirect use of this data by setting up the following quantitative experiment.

Beginning with Kroch (1989), Pintzuk (1991), Santorini (1993), and replicated in much in much subsequent work (e.g. Wallenberg 2009, and Fruehwald et al. 2010 for phonological rule change), it has been found that during periods of change in a given syntactic parameter, different constructions in a language which constitute various instances of that parameter underlyingly (i.e. different syntactic contexts where the parameter appears) will increase in frequency or decline in frequency at the same rate. This is known as the “Constant Rate Effect” (Kroch 1989). Taking the Constant Rate Effect as a theorem, all constructions which express Tense-final are expected to decline in frequency over time at the same rate. By hypothesis, all clauses with objects preceding the finite verb are Tense-final; that is to say that if the GHC is valid, then the appearance of an object to the left of a finite verb should mean that the clause is underlyingly Tense-final. The change in the parameter setting from Tense-final to Tense-medial also expresses itself in other construction types, including the diagnostic contexts I discussed in (4.1).

If unambiguous Tense-final clauses, marked by a clear diagnostic, decline at the same rate as clauses with objects to the left of a finite verb, then that is good evidence that they both express the same underlying parameter, Tense-final. On the other hand, if GHC-violating scrambling across Tense were to exist, then clauses with objects to the left of a finite verb would be a mixture of underlying Tense-final and Tense-medial, and so they should not decline at the same rate as unambiguously Tense-final clauses with a clear, independent diagnostic. In order to demonstrate that this effect holds for our data set, I have chosen the most frequent diagnostic context of those in (4.1), negation, and extracted all finite negative subordinate clauses

(i.e. with or without auxiliaries) from the corpus (ensuring the highest possible N for statistical comparison). To compare with this sample, I extracted an entirely independent (i.e. non-overlapping) set of clauses which would all be ambiguous for Tense if the GHC were not taken into consideration: positive (i.e. no negation) subordinate clauses containing a finite lexical verb (i.e. no auxiliary) and an object of some kind, such as (36).¹⁷ The GHC predicts that clauses with the order **Object** > **V-finite** are Tense-final, since the object could not have scrambled across the verb, and so these should decline at the same rate as the unambiguously Tense-final **Negation** > **Aux/V-finite** clauses.¹⁸ The results below show that this is the case.¹⁹

[Insert Figure 1 (color on web, black and white in print)]

[Insert Table 4]

Mere inspection of the curves in Figure 1 shows that they might have the same slope (and indeed, are close to being the same curve), but we can check this more rigorously with logistic regression: this is the standard procedure for statistically modeling the distribution of data for each syntactic context, and then comparing the difference between the two models (see Kroch 1989; Pintzuk 2005; Pintzuk and Tay-

¹⁷Clauses with auxiliaries are excluded in order to control for the possible confound of the West Germanic Verb Projection Raising construction (VPR), which can produce an **Aux** > **Object** > **V** order in an underlyingly Tense-final clause. Clauses with auxiliaries were not excluded from the negation sample because negation is only very rarely trapped in the raised projection when VPR occurs, as negation-trapping-VPR will prevent negation from having matrix scope (Haegeman and van Riemsdijk 1986; Kroch and Santorini 1991; Haerberli and Haegeman 1998). I assume that this option is employed too rarely to disturb the statistical results presented below. VPR with objects, on the other hand, can be very frequent, and occur at very different frequencies in different texts (as Pintzuk and Haerberli 2006; Haerberli and Pintzuk to appear, show for OE), and so clauses with auxiliaries must be excluded from the sample of finite clauses with objects. Thank you to an anonymous reviewer for pointing out this potentially serious confound. All clauses in this study also include subjects, so that embedded topicalization can be excluded as a possible derivation for preverbal objects. A final note: object extraposition can create an order of **V-finite** > **Object** in an underlyingly Tense-final clause, but this should not affect the estimated rate of change in this sample of clauses, since Santorini (1993) shows that object extraposition occurred at a stable frequency over time in Yiddish Tense-final clauses.

¹⁸Note that in the *Penn Yiddish Corpus*, there is no annotation to distinguish pronominal objects from nominal DP objects, so I have included both types in all counts. While this is not ideal, it has not obscured the effect shown below.

¹⁹In order to control for the effects of dialect over time, this study used data exclusively from East Yiddish texts. Another reason for this choice is that West Yiddish texts do not have the same time-depth as East Yiddish texts, since West Yiddish is not represented in this data set after 1798.

lor 2006; Santorini 1993, and references for other examples of using logistic regression in modeling syntactic change).²⁰ The chart below in Figure 2 shows a plot of logistic models for each context,²¹ and the estimated functions are so similar to each other that the curves are contained within each other's shaded error zone; they are statistically the same curve, once we have abstracted away from randomly distributed noise.

[Insert Figure 2]

The model comparison in Table 5 confirms that the curves have the same slope. There is a clear main effect of Year on the frequency of T-final ($p < 0.001$) which we would expect, given that we know there is a change in progress during the time period. However, there is no significant main effect of the two contexts ($p = 0.23$), indicating that the curves are very likely the same curve. Similarly, there is definitely no difference in how the effect of context interacts with Year; the contexts continue to have the same effect on the proportion of T-final over time, i.e. the same rate of change applies in each context ($p = 0.35$). In fact, the p-value shows a very good fit for the model that assumes the same rate of change in both contexts; we can expect our observed distribution to occur about 35% of the time by chance (through random noise), if assume that the underlying function producing the data is one with the same slope for both contexts. It is likely that the two contexts, finite negative clauses and positive transitive clauses with finite lexical verbs, are expressing a change in the same underlying parameter.

[Insert Figure 5]

The fact that this quantitative study showed such a robust pattern, despite the unavoidable noise of the historical record, constitutes another type of evidence that object position (i.e. scrambling) is constrained by the presence of left-headed functional projections. The position of Tense determines the scrambling possibilities, and so it is possible to observe the Tense-final to Tense-medial change in Yiddish simply by observing the position of objects relative to the verb (in non-topicalization contexts). This result also represents a methodological advance, because we can now

²⁰Of course, modeling dynamic systems with the logistic function is by no means specific to language change: a logistic curve is the characteristic shape of evolutionary competition between two variants in a population with finite resources (Nowak 2006, 12)

²¹Note that while the number of clauses are binned by century in Figure 1 and Table 4 for the convenience of the reader, the logistic regression was done treating each year as a single data point, not binned by century.

add to the set of diagnostics for identifying Tense-final clauses in historical texts from languages undergoing a phrase structure change in progress: aside from the effect of some non-scrambling movement process (e.g. A'-movement or clitic-movement), the presence of a preverbal object diagnoses a head-final structure (see also Pintzuk 2005 and Pintzuk and Taylor 2006 for the proposal that preverbal, non-quantified²² objects are diagnostic of head-final structure).

Note also that, assuming the validity of the Constant Rate Effect is not in question, there cannot have been a loss of scrambling across Tense during the extent history of Yiddish. Nevertheless, scrambling to before Tense is not possible in modern Yiddish, as discussed in section (3), so any proposal that scrambling across Tense was possible at an earlier time would have to posit that it was lost at some point during the time period of the study above. If scrambling had occurred across Tense at some point during the time period above, it would have changed the trajectory of the change in the object context such that the decline in pre-Tense objects would not have occurred at the same rate as the decline in pre-Tense negation. When this theoretical scrambling disappeared, its loss would have combined with the loss of left-headed TPs to make the curve for pre-Tense objects much steeper than a curve which represented the change in Tense alone, as the pre-Tense negation curve does. Since this is not the case, the loss of pre-Tense objects must be only a reflection of the same change as the loss of left-headed TPs. Therefore, the only possible conclusion is that scrambling could never cross Tense at any time during the history of the language.

4.3 Yiddish and Greek

Thus, the diachronic path of Yiddish shows us that the modern Yiddish scrambling system is exactly the same as the modern German scrambling system, but with a single parameter toggled. The Generalized Holmberg Constraint does not change, but the change in the Tense parameter created a new context where the constraint

²²In the Yiddish study, quantified and non-quantified objects have not been separated, which would have been ideal as quantified objects have been found to have different syntactic properties in other Germanic languages (see Pintzuk and Taylor 2006, 2004; Rögnvaldsson 1987; Jonsson 1996; Svenonius 2000, among others). This is simply due to the lack of part-of-speech annotation on nominals in the *Penn Yiddish Corpus* (unlike the more robust annotation in e.g. the *York-Toronto-Helsinki Parsed Corpus of Old English Prose*, Taylor et al. 2003). However, under the assumption that the syntax of quantified objects did not specifically change over the history of Yiddish, this inaccuracy in the study should not affect the overall results. Eventually, I would like to improve the annotation of this corpus and repeat the study with better control of this and other variables.

applies. Note that this result is virtually identical to the findings of Taylor (1990)'s study of the relationship between "clitic" position and clause-structure change in Pre-Medieval Greek.²³ Like Yiddish, Pre-Medieval Greek changed from Tense-final to Tense-medial, and it also had a system of weak pronoun scrambling ("clitics" in the traditional Greek terminology). In unambiguously Tense-final clauses, Greek clitics show behavior that is quite similar to that of weak object pronouns (and other scrambled elements) in German and other OV Germanic languages: they scramble leftward potentially as far as C, left-adjoining to maximal projections (as Taylor discusses, this is the simplest analysis of the syntax once the effects of prosodic inversion are accounted for). In fact, Taylor shows that the final landing site of scrambled clitics can be any one of a number of phrasally-adjoined positions, in the case that TP and/or *v*P are recursive due to the presence of adjoined modifiers or the scrambling of other elements in the clause. Below I repeat two of Taylor's examples, showing two landing sites for clitic pronouns (in boldface) in predominantly Tense-final Homeric Greek.

- (37) aiei =**toi** muthoi philoi akritoi eisin
 always to-you words dear endless are
 "endless words are always dear to you"
 (Illiad, 2.796, Taylor 1990, 126)

- (38) akhlun d' au =**toi** ap' ophthalmo:n helon
 mist P again your from eyes took-away
 "I took the mist away from your eyes again"
 (Illiad, 5.127, Taylor 1990, 127)

The change in the position of Tense in Greek can be seen in the loss and eventual disappearance of Tense-final clauses such as (39) below, and the rise of clauses with the Tense-medial pattern in (40). By the time of New Testament Greek, the Tense-medial system has become far and away the dominant system. The two clauses in (39)-(40) also each contain a clitic pronoun.²⁴

²³I use the non-traditional term "Pre-Medieval" in order to avoid confusion: Taylor (1990) considers Ancient Greek from the early, Homeric period through Koine New Testament Greek. Her study did not include the Medieval Greek dialects described in Condoravdi and Kiparsky (2002) and Condoravdi and Kiparsky (2004). See (Wallenberg 2009, 61) for a brief discussion of how to reconcile their study of Medieval Greek with Taylor's findings for Pre-Medieval Greek.

²⁴Following Taylor (1990), from which these examples are taken, I use a Romanized orthography rather than traditional Greek orthography, with the only difference being that I indicate long vowels with following colons rather than bars. As in Taylor, "=" indicates a phonological clitic-host boundary.

- (39) kai =**min** deuterο:i etei talantou Aigine:tai de:mosie:i
 and him in-second year talent Aeginetans for-public-service
 misthoutai
 paid
 “and in the second year the Aeginetans paid him a talent for public service”
 (Herodotus 3.131.2, Taylor 1990, 145)
- (40) ho arkhierous ekse:neike =**sphi** phialas khrouseas
 the high-priest brought-out to-them cups gold
 “the high priest brought gold cups out to them”
 (Herodotus 2.151.1, Taylor 1990, 147)

Apart from the clitic/weak pronoun in (40), this latter type of sentence (surface SVO sentences) is ambiguous with respect to the position of Tense, because of the possibility that it was derived by rightward extraposition of the object across the verb. Even so, as Taylor discusses, some of the ambiguous sentences are potentially Tense-medial even in the earlier stages of the language in which clauses are predominantly Tense-final. The frequency of these ambiguous clauses increases (along with that of other head-initial structures in the language) as the change progresses from Homeric Greek through New Testament Koine Greek, in roughly 100 C.E. Unambiguously Tense-final clauses (with multiple heavy constituents preceding the finite verb; cf. Pintzuk 1990, Santorini 1992, Santorini 1993 for further discussion of this diagnostic), such as (39), steadily decrease in frequency and ultimately disappear from the language.

But it is the position of clitic arguments in sentences like (39) and (40) that is the crucial point for the purposes of the current study. Taylor shows that as the frequency of the ambiguous, SVO clauses increases at the expense of unambiguously Tense-final clauses, the position of clitic pronouns also changes in the (otherwise) ambiguous SVO clauses. As the change to left-headed TPs progresses in Greek, weak pronouns cease to appear in preverbal positions, and increasingly appear in a position immediately following the finite verb. Furthermore, the post-tensed-verb clitic position is not available in unambiguously Tense-final Pre-Medieval Greek clauses (Taylor 1990, 154), indicating that the post-verbal position is purely a feature of the Tense-medial grammar. Again, the Generalized Holmberg Constraint predicts the change in clitic position that Taylor observed, if Pre-Medieval Greek clitics were indeed weak pronouns with scrambling behavior, as Taylor’s study suggests. Viewed from this perspective, both the change in Greek clitic position and the change in object scrambling in Yiddish are reducible to the change in the position of Tense. If

the Generalized Holmberg Constraint is simply a universal and, by definition, cannot change, then the development of a left-headed TP immediately inserts a barrier to leftward scrambling. Any elements that are allowed to scramble leftward in Greek and Yiddish are immediately trapped in lower surface structure positions in the new grammar than they were under the old Tense-final grammar.

5 What doesn't change, doesn't change

The diachronic studies above show that while the Yiddish TP changes, the GHC remains constant. This stability is the behavior we would expect from a syntactic universal: changes to the phrase structure interact with the constraint, causing the surface effects to change over time, but the constraint itself is constant. Similarly, the scrambling operation does not change over the course of the diachronic development of Yiddish, but scrambling cannot surface in all of the same contexts in Modern Yiddish as it did in Early Yiddish.

Both of the diachronic studies above show strong evidence that the GHC is actually a linguistic universal: both show that there is a striking gap in the set of logically possible combinations of the two scrambling positions (TP-adjoined and *v*P-adjoined) and the two TP structures during the period of phrase structure variation. If there were only a statistical tendency for scrambling to be restricted by the position of verbal heads then we would expect to see some violations of this tendency while the system is still in flux, during the beginning of the change in progress in the structure of the TP. The fact that no such violations occur means that the GHC does not have to develop over time or even be learned by speakers: it is a fact about the relationship between scrambling and functional heads that is inherent in the system, and it asserts itself on whichever variant of TP happens to occur in a given clause. Diachronic evidence of this type is stronger than the usual type of argument for language universals, i.e. cross-linguistic typological evidence, because so much of the syntactic system is held constant between Early Yiddish and Modern Yiddish. We know which parameter changes, and so we know the entire predicted envelope of variation during the change in progress. Systematic gaps in the logically possible scope of variation can only be caused by some syntactic principle that has remained constant.

Furthermore, it is not clear that the GHC could be learned during a period of variation like the Yiddish one, since learners of Yiddish would have no access to negative evidence. On the contrary, most of the subordinate clauses they would use to learn the structure of TP would be ambiguous between Tense-final and Tense-medial, as I discussed above. Learners would see frequent instances of objects preceding

the finite verb with no additional indication regarding the underlying position of Tense. If there were no GHC, these clauses could be interpreted as Tense-medial with scrambling past Tense, which would have led to a different Modern Yiddish system. Another conceivable possibility is that children could learn that C blocks scrambling, on the basis of matrix clause evidence, but that Tense does not. Not only did these possibilities not become modern Yiddish system, but the studies above indicate that they were never even innovated while the change was in progress. This is particularly surprising in light of the fact that the Tense-final grammar provided no evidence that Tense blocked scrambling, and most clauses would have been Tense-final at the beginning of the change. In line with the other facts, this diachronic poverty of the stimulus argument supports the idea that acquirers knew the GHC without having to learn it.

One might question the validity of the GHC by arguing that the Yiddish TP never changed its headedness at all, but rather the entire change described above (and by Santorini) was a change in scrambling: that scrambling used to be able to cross Tense, but then the scrambling operation changed to only target lower positions in the phrase structure. This would be the obvious analysis of the change for proponents of a Kaynian approach to scrambling like the one in Hinterhölzl (2006). However, the persistence of scrambling past the subject in modern Yiddish under V-to-C movement argues strongly against such an idea. As examples (24)-(27) in section 3 showed, when Tense has moved to C, thus moving the Tense barrier, scrambling to TP-adjoined position was never actually lost at all. The modern Yiddish examples show the same pattern as earlier examples such as the ones in (41)-(43). When Tense has incorporated in C, the distinction between Early Yiddish scrambling and modern Yiddish scrambling disappears. (Note that, parallel to (24)-(27), the position of negation in (43) and the definiteness of the subject in (41) and (43) makes it likely that the subject has raised out of the *v*P in these examples.)

- (41) vi vern das isral visn
 how will that Israel know
 “How will Israel come to know that?”
 (Isaac ben Aaron Prossnitz’s *Sefer shir ha-shirim*, date: 1579)
- (42) vorim hot zikh koydesh borkhi bevizen dorkh fayer
 why has SELF Holy-one-blessed-be-He revealed through fire
 “Why has God revealed himself through fire?”
 (*Tsenerene*, date: 1600)

- (43) vi zal dikh das nit far drisn
 how should you that not bother
 “How can that not bother you?”
 (*Kinh el gzirut hkhilut dk’k akreyeni*, date: 1648)

Similarly, Wallenberg (2008, 2009) showed that phrase structure change in English had the same basic effect of restricting object scrambling as it did in Yiddish, though in English scrambling (and later, object shift) ultimately becomes even more restricted than in Yiddish. In English, the combination of three changes have the cumulative effect of restricting scrambling to below *v* by Modern English times: the change from Tense-final to Tense-medial TPs in Old English through Early Middle English (Pintzuk 1991), the change from OV to VO *v*Ps in Late OE and throughout Middle English (Kroch and Taylor 2000), and then later, the loss of V-to-T movement in Early Modern English (Kroch 1989, *among others*). A similar effect may be seen in Spanish, which is uniformly left-headed in the modern language, but which still shows a robust scrambling pattern in low positions in the phrase structure: below T in clauses with finite lexical verbs and V-to-T movement (Ordóñez 1998), and below *v* in clauses with auxiliaries (Francisco Ordóñez, p.c.). These scrambling patterns persist in modern Spanish, in a way that is not possible in modern English (i.e. even below *v*) because of the possibility of leaving subjects particularly low in the phrase structure in Spanish transitive clauses.

However, in the time period before the loss of V-to-T in English had gone to completion, Early Modern English continues to show scrambling to high TP-adjoined positions just in case the clause contains a finite lexical verb, and this main verb has moved to T and then to C. Thus, the pattern in the English V-to-C examples in (44)-(45) (from the PPCEME, Kroch et al. 2005) is the same high scrambling pattern as in the Yiddish examples (41)-(41) (this pattern is referred to as “long object shift” in the Scandinavian literature, since Josefsson 1992). The pattern also appears up to the present day in the fossilized expression, “So help you God”.

- (44) Then sought him the Iewes at the feast
 “Then the Jews sought him at the feast.”
 (*Tyndale’s translation of the New Testament*, John 7:11, date: 1534)
- (45) & so calle it the Turkes zit
 and so call it the Turks still
 “The Turks still refer to it in that way.”
 (*Mandeville’s Travels*, date: c. 1400)

These relatively late examples (relative to the Tense and OV-to-VO changes) show the only remnant of TP-adjoined scrambling that can survive in English once the Tense and *v* heads are in a configuration to block scrambling by the GHC. (See Wallenberg 2008, 2009 for the full argument and more English examples of the type above.) Note also that the post-subject position of the *v*P-adjoined adverb *zít* in (45) suggests²⁵ that the subject appears in Spec(TP), which would mean that the object *it* has scrambled to a position higher than Spec(TP); compare the position of the subject and adverb *still* in the modern English translation.

Wallenberg (2008) shows that the frequency of scrambling past the subject in such V-to-C examples is stable across Middle and Early Modern English, as long as lexical verbs continue to be able to raise to T (and thus to C). This indicates that the structural targets of the scrambling (or object shift) operation itself have never changed,²⁶ just as I have argued for Yiddish. Rather, a stable scrambling operation becomes more restricted over time because of the interaction between the GHC and the more modern clause structure variants. Finally, as argued in Wallenberg (2008), modern Belfast English shows that if lexical verb movement to C is maintained in any context at all, the movement of objects past the subject position remains robust. Henry (1995) gives the examples in (46)-(47) from “Dialect B” of modern Belfast English, which shows lexical verb movement to a head above T only in the case of imperatives (compare the Early Modern English imperatives discussed in Han and Kroch 2000).

- (46) Eat them you now.
 “You, eat them now!”
 (Henry 1995, 65)
- (47) Read it everybody quickly
 “Everybody, (you) read it quickly!”
 (Henry 1995, 71)

²⁵I hedge here just because *still*, the closest translation of positive-polarity ME *zít*, can exceptionally appear clause-finally in modern English, as pointed out by an anonymous reviewer. However, this is not the most natural position for modern English *still*. I performed a small corpus study on the PPCME2, looking only at clauses containing an auxiliary and a nonfinite verb (to distinguish clause medial from clause-final position), and not containing negation (to approximate positive polarity). In both corpora together, positive-polarity *yet/zít* appears in clause-final position (i.e. following the nonfinite verb) in 35/140 cases, or 25%. So we cannot rule out the clause-final analysis of *zít* in this sentence, though it is definitely a minority variant in ME.

²⁶However, English is different from Yiddish in that English scrambling becomes mainland Scandinavian-style object shift by the Early Modern English period; scrambled elements are restricted to be pronominal objects, which still holds true for Belfast English imperatives. However, the scope of scrambling or object shift remains unchanged, modulo the GHC.

The persistence of these very old, high-scrambling patterns in Yiddish and English make it very unlikely that the phrase structure changes in these languages involved changes in the possible landing sites for scrambling. On the other hand, assuming a straightforward relationship between the GHC and the position of functional heads in the phrase structure leads to correct predictions for the scope of scrambling in each historical stage of these languages. Finally, if the GHC is a universal, that explains why it remains stable in spite of the various changes to the syntax of these languages. In the next section, I will address the question of how the GHC integrates with our current theory of syntax, and why such a constraint might be a universal one.

6 Theoretical Status of the GHC

Now that I have established the empirical validity of the GHC, this section focuses on the exact statement of the GHC and its place in the architecture of the grammar. In particular, is the constraint compatible with standard assumptions about the grammatical architecture? And is it stated in the most general form possible and therefore, the most scientifically interesting form? I suggest that the answer to both questions is “no”, as things stand. In this section, I argue that the GHC is really not a unitary theoretical object at all, but rather an LF-interface effect. It is merely a by-product of the interface between the narrow syntactic derivation and LF which happens to show itself most clearly in the realm of scrambling, because of scrambling’s status as non-feature-driven movement. However, an effect related to the GHC can also be seen even in some types of feature-driven movement, and I will propose that reconstruction is another version the same interface effect as the GHC. Furthermore, the LF interface effect, which I will call the “Conservation of C-Command”, is only statable under an antisymmetric approach to phrase structure (originating in Chomsky 1995; Kayne 1994). Once an antisymmetric approach to head-finality is adopted, and applied to the Yiddish change above, it becomes possible to restate the GHC in terms of the c-command relations holding between functional heads and their arguments at LF.

6.1 A Typology of Movement

Movement disturbs the c-command relations which hold at the beginning of any derivation. If we take seriously the typology of movement proposed in Chomsky (1998), then movements have different properties depending on, 1) whether they change the c-command relations in the tree differently, and 2) whether there is a head in a disturbed c-command relation which itself triggered the disturbing movement.

This is a rather abstract statement, but it is a very general way of stating a theory of movement where movement is either “directly feature-driven”, “indirectly feature-driven”, or “not feature-driven” (as proposed in Chomsky 1998). Direct feature-driven movement occurs when there is exactly one landing site for the movement, and it is the specifier of the head whose feature composition triggered the movement; this is how A-movement is defined in Chomsky (1998). A more general way to state this type of movement is that direct feature-driven movement allows an XP to escape the c-command domain of exactly one head H, and H is the head which triggered the movement by probing for some feature. If A-movement ever causes an XP to escape the c-command domain of more than one head, then each head whose c-command domain was escaped must bear its own feature which specifically motivated the movement. This is the case in typical A-chains, such as an English finite clause containing a passive: the complement of V has moved to Spec(*v*P) because of the featural content of passive *v*, and then it has moved to Spec(TP) because of the featural content of T. These are two independently triggered movements in sequence, rather than truly cyclic movement.

A'-movement, on the other hand, is different from A-movement because it is indirectly feature-driven: there is a head, e.g. C, which bears a feature triggering the movement, but non-locally. The movement progresses through the specifiers of other heads (in fact, an arbitrary number of other heads) before it finally checks the feature on the head which triggered it.²⁷ In this way, A'-movement is feature-driven, but it is not the case that every landing site for the movement is in the specifier of the head that ultimately triggered the movement, since the moving element must keep moving cyclically until it checks the primary triggering feature. (The idea that “peripheral” or “P-features” (Chomsky 1998) always trigger this type of cyclic movement makes sense according to theories of syntactic domains such as Platzack (2000), in which peripheral features encode information-structural relations and are only ever present on heads in the C-domain.)

²⁷As Chomsky (1998) admits, such a derivation under phase theory would violate the Phase Impenetrability Condition unless the intermediate movements were triggered locally in their phase, so that e.g. a *wh*-word inside *v*P doesn't have to “look ahead” outside of its phase to a CP which hasn't been built yet, or conversely, C doesn't have to “look into” a lower *v*P phase which has already been closed off in order to attract the *wh*-phrase. Phase theory thus makes A'-movement resemble A-movement in that they both involve strictly local feature-checking. However, I will assume with Chomsky that however one implements intermediate landing sites for A'-movement in phase theory, there still must be some relationship among the features on the intervening heads such that the one driving the movement is the highest one, e.g. C for *wh*-movement, and the lower ones are just constrained to match the higher head in their featural content. So such Agree-like relationship needs to exist between the heads in an A-chain.

In terms of changing c-command relations, the way A'-movement differs from A-movement is that it only adds new c-command relations, but does not subtract any. This is another way of saying that A'-movement reconstructs: the copy left by A'-movement means that no initial c-command relation is removed during a derivation, though new ones are added through higher copies. This contrasts with A-movement, which actually removes a c-command relation when the lower copy is deleted (i.e. a head used to c-command the lower copy, and after deletion of the lower copy, the head no longer c-commands it). I take reconstruction effects to reflect the “indirect” way that features drive A'-movement, as I will explain further below. By now it should be clear that when I say that a c-command relation is or is not disturbed during the course of a derivation, I am actually referring to whether the c-command relation is disturbed either during the narrow syntactic derivation, where movement creates copies, or at the interface with LF, where some copy-deletion takes place.

Finally, the typology of movement I have described above makes it immediately apparent why scrambling has never fit well into the A/A'-distinction (recognized since at least Mahajan 1990; Webelhuth 1989): the A/A'-distinction is not a primitive one, but rather stems from what is driving the movement (features) and the geometric configuration holding between the driving features and the moving element. Understood from this perspective, scrambling falls nicely into the typology I have described above: it is a type of non-feature-driven movement, as Chomsky (1998) suggested for “stylistic movement”. This is very similar to the conclusion reached by Webelhuth (1989) that scrambling was a “mixed” type of movement, though he did not have the theory of feature-driven movement to describe precisely how scrambling is different from feature-driven movements. The idea that scrambling is not feature-driven, but rather “stylistic”, makes a great deal of sense in light of the well-known fact that scrambling is optional in a large number of cases (see also Fanselow 2001, for arguments that scrambling is not feature-driven). Even in cases where scrambling appears to be obligatory, such as when unstressed pronouns must scramble (Cardinaletti and Starke 1995) or when DPs must scramble out of the *v*P in order to have certain interpretations (Diesing 1992, 1997), the requirement is always that the scrambling DP must *leave* a particular configuration; the final landing site of the scrambling DP may still be among a range of options. If scrambling were truly feature-driven, then we would expect it to target a single landing site: the specifier of the head bearing the triggering feature.²⁸ This optionality also appears to hold

²⁸Note that even in the case of the English “topicalization” type of A'-movement, which is also arguably optional, there is still no optionality in the location of the final landing site, which indicates that it is feature-driven (by a feature on C, Focus, or Force, depending on one's assumptions about the architecture of the C-domain).

for object shift, particularly in Swedish: where a variety of potential landing sites may be observed, object-shift can potentially target all of them, even when a weak pronoun cannot felicitously remain in its original position (see examples in Hellan and Platzack 1995).

While scrambling is optional in terms of final landing sites, it must nevertheless take place in the narrow syntactic component. The cases in which an element must scramble in order to arrive at a well-formed and felicitous sentence show us that scrambling interfaces with both PF (e.g. as in the unstressed pronoun case) and LF (e.g. as in Diesing 1992). The fact that scrambling is frequently motivated by prosodic concerns (and thus also by information-structural concerns) has been well known since one of the first careful studies of scrambling in German, Lenerz (1977). Lenerz's study first established that scrambling is frequently a strategy to move unstressed DPs (i.e. unfocused and non-contrastive) to some position leftward of the nuclear accent of the clause (generally on the final XP, cf. Cinque 1993), allowing the accent to fall on some other constituent which must receive the stress for some information-structural reason (generally focus). Note that it is difficult to argue that the scrambling is triggered by something like a syntactic Focus feature in these cases: the scrambling DP is the unfocused constituent, and it may surface in a variety of landing sites as long as it is not in position to receive the nuclear accent. I therefore follow Lenerz in assuming that this type of scrambling is motivated by the way the syntax must interface with PF, in a given information-structural or discourse context.

For example, the sentence in (48) shows the *in situ* order, with the object following the PP adjunct, and (49; repeated from above) shows the scrambled order, in which the DP has moved leftward across the PP.²⁹ Without any information about prior discourse, both of these orders are grammatical in German. In that sense, scrambling of the object is optional from a purely syntactic point of view. If we provide a discourse context such as "What happened?", which implies *vP*-focus in its answer, then both orders are still possible answers; scrambling of the DP is still optional. There does not seem to be any effect of Last Resort here, since the scrambling movement is possible even though it is not necessary to guarantee convergence of the derivation. Similarly, there cannot be any feature present which necessarily triggers scrambling in this discourse context, or else the *in situ* order would be ungrammatical in the same context. On the other hand, both of these observations can be understood if scrambling isn't feature-driven at all, but is rather truly optional from a syntactic perspective.

²⁹Thank you to Beatrice Santorini for the judgments concerning (48) and (49).

- (48) Johann hat auf dem Markt die Lebensmittel gekauft.
 Johann has at the market the groceries bought.
 “Johann bought the groceries at the market.”
- (49) Johann hat die Lebensmittel auf dem Markt gekauft.

However, if we provide a context which implies focus on specifically the DP or the PP, then one of the sentences above will be preferred. As an answer to the question, “What did Johann buy in the market?”, (48) is preferred. The object is in focus because of the question, and so it is preferable to leave it *in situ* where it can receive the default clausal accent. As an answer to the question, “Where did Johann buy the groceries?”, (49) is preferred. The PP is in focus because the preceding context questions it, and so it is preferable to move the object leftward, leaving the PP to receive the default accent. Note that focus does not trigger the movement, *per se*: if movement occurs at all, it is the unfocused element that moves.

Even though scrambling has a relationship to PF, as shown above, it also clearly interfaces with LF. Therefore, scrambling cannot be analyzed as merely a PF operation. As I mentioned above, Diesing (1992) and Diesing (1997) showed that scrambling can have effects on the interpretation of indefinites in particular. Additionally, scrambling to certain positions can have clear binding effects, as shown for Hindi (Mahajan 1990), German (Frank et al. 1996; Lee and Santorini 1994), Korean (Frank et al. 1996; Lee 1993; Lee and Santorini 1994), Spanish (Ordóñez 1998), Japanese (Saito 1992; Wallenberg 2009), *inter alia*. Under the standard assumption (since Chomsky 1981) that binding is an LF phenomenon, scrambling must therefore also interface with LF. For example, the Japanese ditransitive in its default order below in (50) is well-formed, but scrambling the dative pronoun to the left of the subject induces a Principle C violation; the dative pronoun in (51) now *c*-commands the R-expression *John* in the possessive phrase (examples from Wallenberg 2009, 251-252). (See the literature above for a full discussion of the effects of scrambling on binding of various kinds.)

- (50) John_i-no imooto-ga kare_i-ni gohan-o ageta
 John_i-GEN sister-NOM him_i-DAT food-ACC gave
 “John’s sister gave him food.”
- (51) *kare_i-ni John_i-no imooto-ga gohan-o ageta
 him_i-DAT John_i-GEN sister-NOM food-ACC gave

Interestingly, examples with the same configuration can show Principle A effects by changing the R-expression in the possessive phrase to a reflexive pronoun, as below.

- (52) *zibunzisin_i-no imooto-ga John_i-ni gohan-o ageta
 SELF_i-GEN sister-NOM John_i-DAT food-ACC gave
 Intended: “Himself’s sister gave John food.”
- (53) ?John_i-ni zibunzisin_i-no imooto-ga gohan-o ageta
 John_i-DAT SELF_i-GEN sister-NOM food-ACC gave
 “Himself’s sister gave John food.”

Now, only the scrambled order in (53) is grammatical, because the dative *John-ni* has scrambled above the subject to bind the reflexive inside the possessive phrase (see Saito 1992, for analogous examples with reciprocal binding).

Even this very cursory demonstration of binding effects due to scrambling is sufficient to show that while scrambling is not an LF operation, it nevertheless must interface with LF in order to have these types of consequences. Similarly, while scrambling cannot be a PF operation, it has definite consequences for PF.

6.2 Movement Types and the Conservation of C-Command

Since it shows clear LF effects in addition to its PF effects, scrambling must take place in the narrow syntactic component (assuming a Minimalist architecture). Otherwise, there would be no way for scrambling to interface with both LF and PF simultaneously. However, since the application of scrambling is frequently optional, and the exact location of its landing site is always optional, it makes sense to consider it a case of non-feature-driven movement within the narrow syntax. I have stated above that how direct the triggering for a movement is, i.e. how close the hierarchical relationship is between Probe and Goal, determines how much the movement is allowed to change the initial c-command relations during a derivation. The most directly triggered movement, A-movement, can both add and erase a c-command relation, since its only landing site is in the specifier of the Probe. A'-movement is less direct, and so it only adds c-command relations, but does not subtract them (it reconstructs).

How then, does non-feature-driven movement affect the initial c-command relations? The answer I propose is: non-feature-driven movement, and therefore scrambling, is not capable of changing the c-command relations between heads and arguments at all. At this point, we can restate the GHC in more precise theoretical terms.

Conservation of C-Command:

C-command relations between heads and XPs are never lost,
 though feature-checking may **add** them or **convert** them during a derivation.

(“Conversion”, discussed below, occurs with A-movement.)

Motivation:

the scope of functional heads with respect to their dependents must be recoverable at LF.

The basic idea behind the Conservation of C-Command, which I will explain in more detail below, is that c-command relations between heads and XPs are important for the interpretation of a sentence. As such, the c-command relations that held at the beginning of a derivation must be recoverable at LF in some way. If a movement leaves a copy which is not deleted at LF, then the original c-command relation is trivially recoverable, because it is still present at LF (the case of A'-movement). If a movement does not leave a copy but does disturb a c-command relation, then the c-command relation must be **converted** into a checked feature on a head (the case of A-movement). This checked feature serves as a bookkeeping device at LF, allowing the original c-command relation to be reconstructed even when the lower copy of a movement has been deleted. Finally, scrambling does not disturb c-command relations at all, at any point in the derivation, because it does not cause an XP to move in such a way that it crosses c-commanding heads. As I will argue below, scrambling is never allowed to disturb a c-command relation, because scrambling does not generally reconstruct (but see footnote 30 below), and the bookkeeping device of **conversion** by feature-checking is not available to scrambling; scrambling does not check any features.

The Conservation of C-Command is not really a constraint; it is an interface effect. In other words, it's not a construct of the linguistic system which filters out certain types of structures, but rather is a mechanical property of the system which is necessary for convergence of the derivation at LF. In the language of Chomsky (2001), it is a “design specification”, which allows the structures built by Merge to be “legible” at LF. In this case, what must be legible at LF is the scope of functional heads over the various XPs in a sentence. To take an extremely simple example, consider a finite English clause containing negation, such as (54) below.

(54) John didn't kiss Mary.

In this case, there are two heads which must scope over the entire event, Neg and Tense ([+past]). Since both heads must scope over the entire event including its participants, there must be a mechanism for determining that Tense scopes over “John”, even though “John” has moved out of their c-command domain to Spec(TP) by A-movement and thus will not reconstruct to Spec(*v*P). Under the standard assumption that scope is calculated in terms of c-command, this means that the original (i.e. at

initial Merge) c-command relations of heads like Tense must be recoverable at LF. Note that whatever determines the deletion of movement copies at LF (a large topic that is in general beyond the scope of this article), it must apply early enough to affect binding relations, which are clearly a type of scope calculation; this is particularly obvious in the case of quantifier binding. If LF copy deletion generally applies before the determining of semantic scope (at least for many A-movement cases), the scope of heads like Tense must be calculable even in the absence of copies. The Conservation of C-command addresses this problem.

Scrambling is the most straightforward case of movement for the LF interface, since it does not move an XP past a functional head, and so it does not disrupt any head's c-command relations from initial merge. Note that head-movement may increase the c-command domain of a head, thus allowing scrambling to follow it to higher landing sites. This derives Holmberg's Generalization for object shift, which I take to be a special case of scrambling. Scrambling is not able to change the c-command relations because only feature-checking preserves a record of the movements that have occurred such that the original scope of a head can be calculated at LF. If scrambling does not change c-command relations, it also does not need to leave copies, which is why scrambling does not reconstruct by default. The maintenance of copies at LF is a strategy that is only necessary for indirectly feature-driven movement, so that the scope of functional heads with respect to the original position of the moved element can be calculated (as I explain below).³⁰

A-movement is the case of a c-command relation being "converted" into a set of checked features. In the simplest case, A-movement erases a c-command relation by moving the given XP locally, just to the specifier of the triggering head; it is frequently the case that a head which has checked an A-feature initially had scope over the XP in its specifier. However, in the case of A-chains, the XP may no longer be in the specifier of one of the heads which triggered the movement, so the surface spec-head relation alone is not enough information to determine the semantic scope

³⁰ It has been noted in the literature that scrambling does reconstruct for binding under certain circumstances (since at least Lee 1993; Lee and Santorini 1994; Mahajan 1990; Webelhuth 1989, *inter alia*). However, it is not the case that scrambling to a specific position always reconstructs, *i.e.* past the subject position, as is sometimes claimed: Saito (1992), Lee (1993), Frank et al. (1996), and Wallenberg (2009) all show that scrambling of an object past a subject can also fail to reconstruct depending on the subject's suitability as a potential binder for the object in question. For the purposes of this article, I assume with Frank et al. (1996) that this type of reconstruction does not bear directly on the question of whether scrambling is A'-movement or not, and that the presence of a subject binder has an exceptional effect on scrambling's ability to reconstruct. In terms of copy deletion, this could mean that a copy of scrambling which would normally be deleted by default at the syntax-LF interface is exceptionally preserved when it is bound by an element in Spec(TP) or Spec(vP).

of all of the heads that the XP has moved past. Fortunately, the identity of the features which were checked on a given head is enough information to recover the fact that the head scoped over the XP in question. For example, if a subject DP has moved to Spec(TP) and checked ϕ -features, then clearly T scopes over a DP with those ϕ -features. In this way, the deletion of lower A-movement copies at the LF interface (as I mentioned above) causes no problems for determining the scope of the heads at LF, and reconstruction of A-movement is not necessary. Note also that even if EPP-driven A-movement of a subject DP to Spec(TP) has potential consequences for binding and other LF phenomena, it does not have any semantic consequences with regard to the scope of Tense. The semantic information in a Tense feature like [+past] always scopes over the whole event, and there should be no additional functional application (in the sense of Kratzer 1996) of the function represented by Tense on the entity represented by the DP.³¹ The “conversion” of a c-command relation into a set of checked features, by the Conservation of C-Command, makes this whole-event scope possible for Tense.

More precisely, if A-movement features have been checked, then the scope of the head with those features at LF must include the closest XP with the same features that the head does **not** c-command. In other words, the checked features indicate that a c-command relation was reversed in the narrow syntax. The scope of the head is then extended by traversing the tree upwards, in the head’s anti-c-command domain until an appropriate XP is found.³² This traversal is sufficient in the case of A-chains since Shortest Attract (Fanselow 1991) will ensure that the closest XP with the correct features is the relevant one. In the case of A’-extraction of an XP which has already been moved by A-movement, the traversal will find the copy of the A’-movement, where the A’-movement reconstructs.

The Conservation of C-Command approach to A-movement achieves the same effect of Sauerland and Elbourne (2002)’s analysis of “total reconstruction”, but without some of the problematic consequences. They propose that a number of cases of A-movement, such as EPP movement of the subject to Spec(TP) in English, only

³¹This could also be true for alternations within the *v*P, e.g. movement of a DP object to Spec(*v*P) in a passive may not result in the additional application of a Voice function on the DP, as the merging of an Agent in Spec(*v*P) would. Depending on how one states the semantics of passive-*v* (a topic well beyond the scope of this article), it could be the case that passive-*v* should simply continue to scope over the derived subject by the Conservation of C-Command in the same way that Tense would.

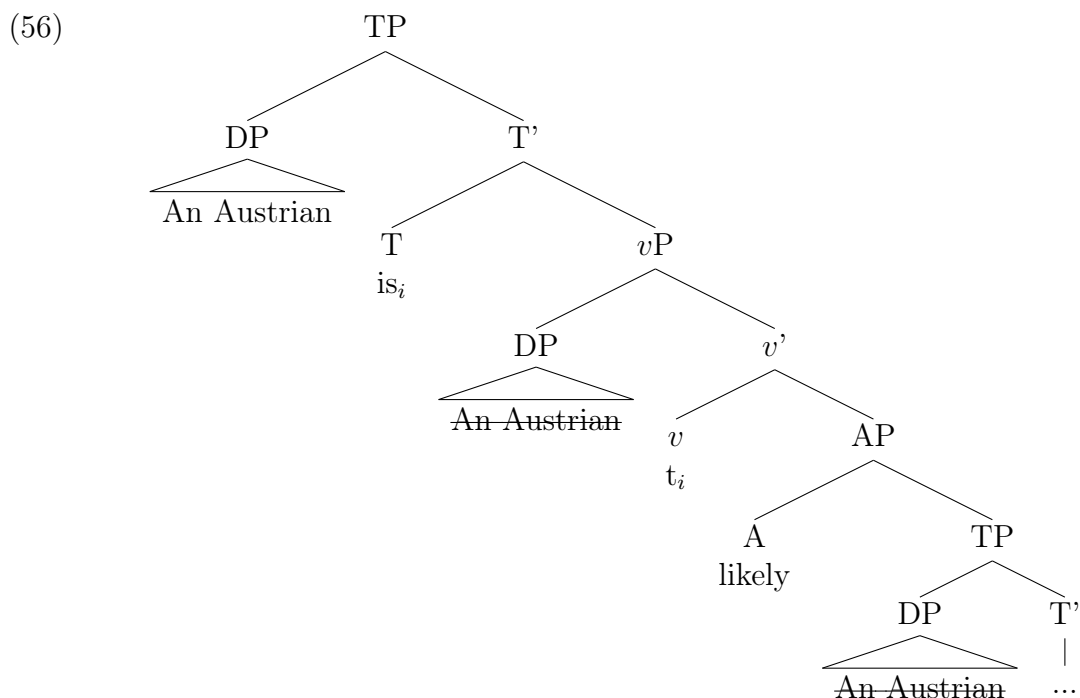
³²Actually, the domain traversed does not need to be the entire anti-c-command domain of the head, but rather can just cover the set of XPs which c-command the head on the surface. So the traversal does not have to be quite so computationally costly, and can simply progress by going from the head up one node and checking the node’s sister, recursively until the XP is found.

occur at PF. Because this type of movement does not occur in the narrow syntax at all, it does not have any LF effect at all; it reconstructs for all purposes, hence “total reconstruction”. Their appeal to PF movement is intended to account for sentences like the following:

- (55) [An Austrian]_i is likely to t_i win the gold medal.
 (Sauerland and Elbourne 2002, 284)

The sentence in (55) has as one of its interpretations the paraphrase, *It is likely that an Austrian wins the gold medal*, where no particular Austrian is in mind. In this way, Sauerland and Elbourne are concerned with a purely semantic type of reconstruction: *is likely* must have the ability to scope over *An Austrian*. If the movement only occurs at PF, then this reading is trivially possible; no movement has occurred from the point of view of LF. In order for Sauerland and Elbourne to account for the other possible interpretation of (55), in which a specific Austrian is in mind, they need to propose that the same sentence can also be derived by real, non-PF A-movement (“stem movement”, in their terms).

The Conservation of C-Command approach has the same effect as the PF-movement approach, but without having to add a new movement type and posit two separate derivations for (55). Suppose that the structure of (55) is substantially as in (56) below (though I recognize that this structure may omit some details that should be present in a complete treatment of this construction):



According to the analysis being developed here, *An Austrian* first moves to $\text{Spec}(vP)$, checking whichever features we take to be active in raising constructions. This feature checking converts the c-command relation between little-*v* and *An Austrian*, ensuring that this c-command relation can be calculated at LF and that little-*v* can scope over *An Austrian*. Then, however one represents the semantic combination of the copula with predicates such as *likely*, the resulting function will be able to apply to *An Austrian* because of the checked features on *v* (i.e. the converted c-command relation). Thus, Sauerland and Elbourne’s low reading is derived. At this point in the derivation, *An Austrian* moves to $\text{Spec}(TP)$, ϕ -features on T and converting the c-command relation between T and *An Austrian* to be recoverable at LF. Because features were checked on little-*v* as well as T, it is also possible to recover at LF the fact that *An Austrian* occupied a position above *v* but below T, which allows for the possibility of a the high reading as well, where a particular Austrian is in mind. However, the feature checking at T also ensures that Tense scopes over the entire event, including *An Austrian*, regardless of which reading is derived with respect to *is likely*.³³

This approach also carries over to the following set of examples in a way that the

³³Thank you to an anonymous reviewer for pointing out that Tense has to scope over the Subject under both readings.

Sauerland and Elbourne (2002) analysis does not. Sauerland and Elbourne correctly predict that the two sentences in (57)-(58) share an interpretation, in which negation scopes over the subject regardless of its surface position.³⁴

(57) There weren't three men arrested.

(58) Three men weren't arrested.

However, if the subject is constructed to contain an NPI, it becomes immediately apparent that the PF-movement account of this alternation is untenable. As above, the subject of the passive in (59) is low, below negation, and Spec(TP) is filled by the expletive "there". Sentence (60) is predicted by Sauerland and Elbourne to be the high-subject counterpart to (59), but it is ungrammatical because of the presence of the NPI in *any men*.

(59) There weren't any men arrested.

(60) * Any men weren't arrested.

Sauerland and Elbourne explicitly state that NPI licensing can take place by total reconstruction, and identify this as a particular benefit of their PF movement account. However, the contrast in (59) and (60) is left unexplained; if EPP-satisfying subject movement is purely PF movement, then it should have no effect on the licensing of *any men*, which should reconstruct totally to the position under negation. And it is clear from their discussion of *there*-insertion examples that Sauerland and Elbourne (2002, 292–295) consider the subject raising in sentences like (58) to be derivable by PF-movement alone.

The current approach, on the other hand, does not deny that the subject-raising movement has taken place in the narrow syntax prior to PF, and so it is possible to rule out (60) if NPI licensing takes place at the narrow syntax stage of the derivation ("the stem" of the derivation, in Sauerland and Elbourne's terms). Additionally, if we assume that Neg has moved to Tense (as indicated by its potential to cliticize), all of the scope possibilities of the resulting complex head for (58) can be determined

³⁴Of course, there is also an additional interpretation for (58), the more felicitous one, in which the speaker has a specific three men in mind. This interpretation is not available in (57), and the difference in readings is another potential argument against Sauerland and Elbourne's proposal, since the difference between the two sentences appears to be one of PF movement, under their proposal. They could assume that true syntactic movement ("in the stem", in their terms) takes place in (58) specifically in order to derive this additional interpretation, but this would be rather *ad hoc*, since (57) shows that there is nothing syntactically ill-formed about leaving the subject low. I do not explore this further at this point further because it is not the objection which most relates to the Conservation of C-Command.

at LF based on the evidence that ϕ -features were checked by the movement. Thus, the interaction between the Conservation of C-Command and directly feature-driven movement (“conversion” of a c-command relation) ensures that no scope relations are lost before the derivation is evaluated at LF.

For A'-movement, the anti-c-command domain traversal I suggested for A-movement cannot reliably determine the scope of a head when that scope has been disturbed by A'-movement. The tree-traversal is sufficient to recover the fact that the head which ultimately triggered the movement originally c-commanded the relevant XP (which will now be in its specifier), but it is not sufficient to recover the c-command relations between the XP and other heads which it might have passed on its way to its final target. This is part of the nature of indirectly feature-driven movement: the movement changes the c-command relations of heads which did not, ultimately, trigger the movement. The example of this from Chomsky (1998) is when a *wh*-phrase moves through the specifier of *v* on its way to the specifier of C, which is the head that truly triggered the movement. Thus, reconstruction is necessary for A'-movement: preserving lower copies at LF allows the initial-merge c-command relations between heads and an A'-moved element to be preserved.

The lower copies of A'-movement which are preserved at LF allow the scope of the all functional heads with respect to the moved element to be calculated. This could, in fact, be the reason that LF copy-deletion obeys economy constraints where A'-movement is concerned. As Fox (1999) shows, the deletion of lower copies of A'-movement is a costly operation: only those copies are deleted at LF which absolutely must be deleted in order to allow convergence. In contrast, the deletion of A-movement copies seems to be more of a default operation, and may occur earlier on the LF branch than the deletion of any A'-copies. Note that if the deletion of A-movement copies obeyed economy constraints, then we would expect A-movement to reconstruct in general for binding, which it does not (at least in many cases; see Lebeaux 1988, 2009, for a discussion of some cases of A-movement reconstruction, in addition to the “total reconstruction” cases I discussed above from Sauerland and Elbourne).

6.3 Antisymmetry and the Conservation of C-Command

Finally, restating the GHC as the Conservation of C-Command makes one additional prediction: scrambling is constrained by the c-command domains of functional heads, but not by their linear placement in the string. It is LF's reliance on hierarchical structure as an encoding of scope that makes this necessary. It is a standard assumption, if a generally unstated one, that LF has no access to information regarding linear

precedence. Going back to May (1977) and May (1985), the input to LF is assumed to be “a class of bracketings labeled with linguistic categories” (May 1985); it is pure hierarchical structure.³⁵ This makes sense, since LF by definition is not concerned with the order in which constituents are pronounced. If the way scrambling is constrained (the Conservation of C-Command) is indeed an effect of the syntax-LF interface, then it can only be a generalization applying to hierarchical relations like c-command. However, the statement of the GHC in section 1 was stated in terms of both c-command and linear precedence, which is incompatible with the proposal that it is an LF effect. As I argue below, it is impossible to capture the GHC as an empirical generalization in terms of an LF condition under a classical phrase structure, but the LF approach follows naturally under some version of the antisymmetry hypothesis (Kayne 1994).

I first stated the GHC in terms of both linear precedence and c-command in order to ensure that only c-commanding heads blocked scrambling, and at the same time capture the relationship between how freely languages scramble and how head-final their phrase structures are. The former condition is necessary to prevent deeply embedded heads from blocking the scrambling of constituents at the *v*P or TP level; for instance, the P head *auf* in sentence (49), repeated below as (61), clearly does not inhibit the scrambling of the direct object past the PP.

- (61) Johann hat die Lebensmittel auf dem Markt gekauft.
 Johann has the groceries at the market bought.
 “Johann bought the groceries at the market.”

The linear precedence part of the GHC was necessary in order to allow constituents to scramble out of the c-command domain of heads in right-headed structures, as in numerous examples above in Early Yiddish, German, and Japanese where objects scramble to the left of high subjects. Under the classical X'-theoretic assumption that right- and left-headed structures are symmetrical hierarchically, but merely linearized separately (also as in e.g. Fox and Pesetsky 2005), there is no way out of this disjunctive definition of the GHC. On the other hand, if the difference between right- and left-headed structures always corresponded to a difference in hierarchy, as Kayne (1994) hypothesized, then it might be possible to state a general bounding condition on scrambling in terms of c-command alone. The Conservation of C-Command is such a statement (though it also has more general consequences),

³⁵Indeed, this could be true of the narrow syntax as well, depending on whether linearization takes place at PF, e.g. in a framework like that of Nunes (2004), or interacts more directly with the narrow syntactic computation, e.g. as in Fox and Pesetsky (2005).

and so it is only tenable if right- and left-headed structures are **not** mirror images of each other.

Since the difference in scrambling behavior in head-final vs. head-initial structures is a real empirical asymmetry between these language types, it is not surprising that it is difficult to shoehorn a constraint like the GHC into a classical, perfectly symmetrical phrase structure. It seems more reasonable to count the existence of the GHC, as an empirical generalization, as an argument against a symmetrical view of head-initial and head-final structures. Under a version of the antisymmetry hypothesis (Kayne 1994) like the one proposed in Biberauer (2003, 2004) and Biberauer and Roberts (2005), and further refined in Wallenberg (2009), generalizations like the GHC are expected to exist because heads in head-final structures do not c-command the phrases to their left. Thus, there is a difference in hierarchy between head-final and head-initial structures, and the GHC can be restated in terms of hierarchical relations alone (again, for a similar argument, see Svenonius 2001). This is a particularly parsimonious result, since I have already argued that the GHC is actually the Conservation of C-Command, an LF interface effect which can only be sensitive to hierarchy because of the nature of LF.

Although a full discussion of the consequences of the Biberauer-Wallenberg analysis of head-finality is beyond the scope of the current discussion, I will briefly illustrate the analysis for the phrase structure change in Yiddish and its effect on object scrambling (for details, see the formal implementation of the analysis and discussion in Wallenberg 2009). The key insight of the analysis, from Biberauer (2003), is that the EPP feature on Tense (for those languages which have one) can be [–pied-piping] in some languages and [+pied-piping] in others. Tense probes for ϕ -features in the same way for both types of languages, attracting the subject DP from Spec(v P) to Spec(TP). In [–pied-piping] languages, e.g. English and French, the DP alone moves to Spec(TP). In [+pied-piping] languages, on the other hand, one additional level of structure is moved along with the subject DP, as if the ϕ -features were copied from Spec(v P) to v P (see Wallenberg 2009 for discussion of the feature-copying mechanism). This causes the entire v P to move to Spec(TP), deriving the Tense-final phrase structure of German, Japanese, or Early Yiddish. This movement of the v P derives the structure shown in (63) for the Tense-final Early Yiddish clause in (6), repeated below as (62).

- (62) ...d[a]z mir yusf di h' zhubim nit gebn vil
 that me Joseph the five guilders not give wants
 “that Joseph doesn’t want to give me the five guilders”
 (court testimony, date: 1465; also cited in Santorini 1992)

(63) d[a]z [_{vP} yusf nit mir di h' zhubim gebn] vil t_{vP}

The movement of the subject *yusf*, pied-piping the *vP*, derives the Tense-final order, but scrambling has not yet applied in (63).³⁶ At this point, the c-command relation between Tense and the entire *vP* has been disturbed by A-movement, but the semantic scope of Tense can be determined at LF because the c-command relation has been converted into a feature-checking relation, according to the Conservation of C-Command. It therefore does no further damage for the objects to scramble higher by non-feature-driven movement, since the scrambling itself does not change any c-command relations. In this way, it is crucial to this analysis of the GHC constraint on scrambling that Tense-final structures are derived by A-movement, which means that they are feature-driven and can convert c-command relations into checked features according to the Conservation of C-Command.

In this particular example, the direct object *di h' zhubim* scrambles past negation (which I take to be adjoined, as in the Scandinavian languages), and the indirect object scrambles past the subject *yusf*. Thus, the surface form of the clause is as in (64):

(64) d[a]z [_{vP} mir_i yusf di h' zhubim_j nit t_i t_j gebn] vil t_{vP}

Note also that this structure, if applied to modern Tense-final Germanic varieties, may account for some of the variation in subject position in languages such as modern German (Haider 1993; Haerberli 1999; Bobaljik and Wurmbrand 2005). While a detailed discussion of this interesting topic is beyond the scope of this article, the low and high positions observed for subjects in modern German could easily be derived if subjects can scramble out of the pied-piped *vP* in a similar way to objects, potentially crossing *vP*- and TP-adjoined adverbs. The fact that definite subjects tend to appear high more often than indefinite subjects can then follow from general constraints on scrambling (as in, e.g. Diesing 1992).

The change in Yiddish from Tense-final TPs to its modern, Tense-medial phrase structure, can now be described as the loss of this *vP* pied-piping. The DP subject moves to Spec(TP) in the new phrase structure just as it always did, but now it does

³⁶I assume that a similar movement within the *vP* has taken place in order to derive the OV order, and that this lower movement continues into modern Yiddish. A full discussion is beyond the scope of this article, but Wallenberg (2009) proposes that the *vP* moves into the specifier of a head X between Tense and *v*, and then this XP moves into Spec(TP). In an example like 62, X is most likely nonfinite Tense, while in the perfect construction it may be a Participle head which is spelled out as past-participle morphology.

not pied-pipe the *vP*. (This is the same analysis proposed in Biberauer and Roberts (2005) for the change in the position of Tense in the history of English.) With the *vP* left in situ, an object could only scramble past a high definite subject of this type by scrambling past Tense, a movement which would violate the Conservation of C-Command by erasing a *c*-command relation with no way to recover it at LF.

7 Conclusions

In a way, the most important work of this article has been to propose and test a medium-level descriptive generalization, the GHC, and to show that the patterns of syntactic change in Yiddish argue strongly for its existence. Furthermore, the existence of such a constraint helps to explain the synchronic patterns of scrambling and object shift and indicates that these phenomena may be the same operation, given that they are constrained in the same way, and that scrambling can develop into object shift over time, as it seems to have done in English. I have also provided an explanation for why such a constraint might exist cross-linguistically: it is a sub-case of the Conservation of C-Command, which relates scrambling to the general theory of movement and reconstruction as non-feature-driven movement. Finally, the Conservation of C-Command is, in part, a restatement of the GHC in terms of hierarchical relations alone. This step is inescapable if scrambling is truly constrained by an LF interface condition, and may be a theoretically desirable step in any case. The fact that this restatement is only possible under an antisymmetric phrase structure constitutes an indirect argument for such approaches, as implemented in Biberauer (2003) and Wallenberg (2009).

It is worth noting that the GHC is essentially the same one proposed in Svenonius (2001), but he could only propose the generalization on the basis of a cross-linguistic comparison between a few languages. The data from syntactic change in Yiddish, on the other hand, shows how the GHC affects a language when the system is largely held constant and a single parameter is toggled, the position of Tense; there is no comparison between synchronic languages or dialects which can achieve so controlled an experiment. In this way, the study here makes a strong case for the idea that the study of syntactic change can be central to testing predictions of syntactic theory. Finally, this level of precise, quantitative observation of a period of syntactic change is only possible given an appropriate experimental infrastructure, i.e. very accurate parsed diachronic corpora. It might therefore make sense for the syntactic community to put more resources into the development of such corpora for more languages.

References

- Bailyn, John F. 2003. Does Russian scrambling exist? In *Word order and scrambling*, ed. Simin Karimi, 156–176. Oxford: Blackwell.
- Bayer, Josef. 1984. Comp in Bavarian syntax. *The Linguistic Review* 3:209–274.
- den Besten, Hans. 1983. On the interaction of root transformations and lexical deletive rules. In *On the Formal Syntax of Westgermania*, ed. Werner Abraham, 47–131. Amsterdam: John Benjamins.
- den Besten, Hans, and Corretje Moed van Walraven. 1986. The Syntax of Verbs in Yiddish. In *Verb Second Phenomena in Germanic Languages*, ed. Hubert Haider and Martin Prinzhorn, 111–125. Dordrecht: Foris Publications.
- Biberauer, Theresa. 2003. Verb second (V2) in Afrikaans: a minimalist investigation of word order variation. Doctoral Dissertation, University of Cambridge, Cambridge, England.
- Biberauer, Theresa. 2004. Reconsidering the EPP and Spec-TP in Germanic. In *Cambridge Occasional Papers in Linguistics (COPiL)*, ed. L. Astruc and M. Richards, 1, 15–40.
- Biberauer, Theresa, and Ian Roberts. 2005. Changing EPP-parameters in the history of English: accounting for variation and change. *English Language and Linguistics* 9:5–46.
- Bobaljik, Jonathan, and Susi Wurmbrand. 2005. The domain of agreement. *Natural Language & Linguistic Theory* 23:809–865.
- Cardinaletti, Anna, and Michal Starke. 1995. Deficient pronouns: A view from Germanic. *Geneva Generative Papers* 3:22–49.
- Chomsky, Noam. 1981. *Lectures on government and binding*. Studies in Generative Grammar 9. Dordrecht: Foris.
- Chomsky, Noam. 1995. Bare phrase structure. In *Government and binding theory and the minimalist program*, ed. Gert Webelhuth, 383–439. Cambridge: Blackwell.
- Chomsky, Noam. 1998. Minimalist inquiries: The framework. MIT Occasional Papers in Linguistics 15, MIT Press.

- Chomsky, Noam. 2001. Derivation by phase. In *Ken Hale: A life in language*, ed. Michael Kenstowicz, 1–52. Cambridge, Mass.: MIT Press.
- Cinque, Guglielmo. 1993. A null theory of phrase and compound stress. *Linguistic Inquiry* 24:239–298.
- Condoravdi, Cleo, and Paul V. Kiparsky. 2002. Clitics and clause structure. *Journal of Greek Linguistics* 2:1–39.
- Condoravdi, Cleo, and Paul V. Kiparsky. 2004. Clitics and clause structure: The Late Medieval Greek system. *Journal of Greek Linguistics* 5:159–183.
- Diesing, Molly. 1990. Verb Movement and the Subject Position in Yiddish. *Natural Language & Linguistic Theory* 8:41–79.
- Diesing, Molly. 1992. *Indefinites*. Cambridge, MA: MIT Press.
- Diesing, Molly. 1997. Yiddish VP order and the typology of object movement in Germanic. *Natural Language & Linguistic Theory* 15:369–427.
- Fanselow, Gisbert. 1991. Minimale syntax. Habilitationsschrift, Published in GAGL, University of Groningen, <http://gagl.eldoc.ub.rug.nl/FILES/root/1991-32/01/GAGL-32-1991-01.pdf>.
- Fanselow, Gisbert. 2001. Features, θ -roles, and free constituent order. *Linguistic Inquiry* 32:405–437.
- Fox, D., and D. Pesetsky. 2005. Cyclic linearization of syntactic structure. *Theoretical linguistics* 31:1–45.
- Fox, Danny. 1999. Reconstruction, binding theory, and the interpretation of chains. *Linguistic Inquiry* 30:157–196.
- Frank, Robert, Young-Suk Lee, and Owen Rambow. 1996. Scrambling, Reconstruction and Subject Binding. *Rivista di Grammatica Generativa* 21:67–106.
- Fruehwald, Josef, Jonathan Gress-Wright, and Joel C. Wallenberg. 2010. Phonological Rule Change: The Constant Rate Effect. In *Proceedings of 40th Meeting of the Northeast Linguistic Society (NELS) 40*.
- Geilfuss, Jochen. 1991. Jiddisch als SOV-Sprache. In *Verb- und verbphrasensyntax*, volume Arbeitspapiere des Sonderforschungsbereichs 340 of *Sprachtheoretische Grundlagen für die Computerlinguistik*, 3–17. Stuttgart.

- Haeberli, Eric. 1999. On the word order ‘XP-subject’ in the Germanic languages. *Journal of Comparative German Linguistics* 3:1–36.
- Haeberli, Eric. 2000. Adjuncts and the syntax of subjects in Old and Middle English. In *Diachronic syntax: Models and mechanisms*, ed. S. Pintzuk, G. Tsoulas, and A. Warner, 109–131. Oxford: Oxford University Press.
- Haeberli, Eric. 2002. *Features, Categories and the Syntax of A-Positions: Cross-Linguistic Variation in the Germanic languages*. Number 54 in Studies in Natural Language and Linguistic Theory. Dordrecht: Kluwer Academic Publishers.
- Haeberli, Eric, and Liliane Haegeman. 1998. Negative concord and verb projection raising in old english and west flemish. In *Negation and the history of english*, ed. G. Tottie I. Tieken-Boon van Ostade and Wim van der Wurff, 101–119. Berlin/New York: Mouton de Gruyter.
- Haeberli, Eric, and Susan Pintzuk. to appear. Revisiting Verb (Projection) Raising in Old English. In *Grammatical change: Origins, nature, outcomes*, ed. J. Whitman D. Jonas and A. Garrett. Oxford: Oxford University Press.
- Haegeman, Liliane, and Henk van Riemsdijk. 1986. Verb projection raising, scope, and the typology of rules affecting verbs. *Linguistic Inquiry* 17:417–466.
- Haider, Hubert. 1993. *Deutsche Syntax - generativ*. Tübingen: Narr.
- Haider, Hubert. 2005. How to turn German into Icelandic – and derive the OV–VO contrasts. *Journal of Comparative Germanic Linguistics* 8:1–53.
- Haider, Hubert, and Inger Rosengren. 2003. Scrambling – non-triggered chain formation in OV-Languages. *Journal of Germanic Linguistics* 15:203–267.
- Han, Chung-hye, and Anthony S. Kroch. 2000. The rise of *do*-support in english: implications for clause structure. In *NELS 30, Proceedings of the North East Linguistic Society*, ed. Masako Hirotsu, Andries Coetzee, Nancy Hall, and Ji yung Kim.
- Hellan, Lars, and Christer Platzack. 1995. Pronouns in Scandinavian Languages: An Overview. *Working Papers in Scandinavian Syntax* 56:47–69.
- Henry, Alison. 1995. *Belfast English and Standard English: Dialect variation and parameter setting*. Oxford University Press.

- Hinterhölzl, Roland. 2006. *Scrambling, remnant movement, and restructuring in west germanic*. Oxford Studies in Comparative Syntax. Oxford: Oxford University Press.
- Holmberg, Anders. 1986. Word order and syntactic features in the scandinavian languages and english. Doctoral Dissertation, University of Stockholm, Stockholm.
- Jonsson, Johannes Gisli. 1996. Clausal architecture and case in Icelandic. Doctoral Dissertation, University of Massachusetts Amherst.
- Josefsson, Gunlög. 1992. Object shift and weak pronominals in swedish. *Working Papers in Scandinavian Syntax* 49:59–94.
- Kayne, Richard S. 1994. *The antisymmetry of syntax*. Cambridge, Mass.: MIT Press.
- Keenan, Edward. 1987. A semantic definition of “indefinite np”. a semantic definition of “indefinite NP”. In *The representation of (in)definiteness*, ed. Eric J. Reuland and Alice G. B. ter Meulen. Cambridge, MA: MIT Press.
- Kratzer, Angelika. 1996. Severing the external argument from its verb. In *Phrase structure and the lexicon*, ed. Johan Rooryck and Laurie Zaring, volume 33, 109–137. Dordrecht: Kluwer Academic Publishers.
- Kroch, Anthony, Beatrice Santorini, and Lauren Delfs. 2005. Penn-helsinki Parsed Corpus of Early Modern English. Size 1.8 Million Words.
- Kroch, Anthony S. 1989. Reflexes of grammar in patterns of language change. *Language Variation and Change* 1:199–244.
- Kroch, Anthony S., and Susan Pintzuk. 1989. The rightward movement of complements and adjuncts in the old english of beowulf. *Language Variation and Change* 1:115–143.
- Kroch, Anthony S., and Beatrice Santorini. 1991. The derived constituent structure of the West Germanic verb-raising construction. In *Principles and parameters in comparative grammar*, ed. Robert Freidin. Cambridge, MA: MIT Press.
- Kroch, Anthony S., and Ann Taylor. 1997. Verb movement in old and middle english: Dialect variation and language contact. In *Parameters of morphosyntactic change*, ed. Ans van Kemenade and Nigel Vincent. Cambridge: Cambridge University Press.

- Kroch, Anthony S., and Ann Taylor. 2000. Verb-complement order in Middle English. In *Diachronic syntax: Models and mechanisms*, ed. S. Pintzuk, G. Tsoulas, and A. Warner, 132–163. Oxford: Oxford University Press.
- Lebeaux, David. 1988. Language acquisition and the form of the grammar. Doctoral Dissertation, University of Massachusetts, Amherst.
- Lebeaux, David. 2009. *Where does binding theory apply?*, volume 50. The MIT Press.
- Lee, Young-Suk. 1993. Scrambling as case-driven obligatory movement. Doctoral Dissertation, University of Pennsylvania, Philadelphia.
- Lee, Young-Suk, and Beatrice Santorini. 1994. Towards resolving Webelhuth's paradox: Evidence from German and Korean. In *Studies on scrambling, movement and non-movement approaches to free word-order phenomena*, ed. Norbert Corver and Henk van Riemsdijk, number 41 in Studies in generative grammar. Berlin: Mouton de Gruyter.
- Lenerz, Jürgen. 1977. *Zur Abfolge nominaler Satzglieder im Deutschen*. Tübingen: TBL-Verlag Narr.
- Mahajan, Anoop. 1990. The A/A' Distinction and Movement Theory. Doctoral Dissertation, Massachusetts Institute of Technology, Cambridge, MA.
- May, Robert. 1977. The grammar of quantification. Doctoral Dissertation, Massachusetts Institute of Technology.
- May, Robert. 1985. *Logical form: Its structure and derivation*. Cambridge, Mass.: MIT Press.
- Nowak, Martin A. 2006. *Evolutionary dynamics: exploring the equations of life*. Cambridge, MA: Belknap Press of Harvard University Press.
- Nunes, Jairo. 2004. *Linearization of Chains and Sideward Movement*. Number 43 in Linguistic Inquiry Monograph. MIT Press.
- Olsvanger, I., ed. 1947. *Royte Pomerantsen*. Schocken Books.
- Ordóñez, Francisco. 1998. Post-verbal Asymmetries in Spanish. *Natural Language & Linguistic Theory* 16:313–346.

- Pintzuk, Susan. 1991. Phrase structures in competition: Variation and change in Old English word order. Doctoral Dissertation, University of Pennsylvania.
- Pintzuk, Susan. 2005. Arguments against a universal base: evidence from old english. *English Language and Linguistics* 9:115–138.
- Pintzuk, Susan, and Eric Haeberli. 2006. Head-final structure in Old English root clauses. In *Diachronic Issues in Generative Syntax*, volume 9. University of Trieste.
- Pintzuk, Susan, and Ann Taylor. 2004. Objects in Old English: Why and how Early English is not Icelandic. In *York Papers in Linguistics*, ed. Jonny Butler et. al. et. al., Series 2, Issue 1. Heslington, York: University of York, Dept. of Language and Linguistic Science.
- Pintzuk, Susan, and Ann Taylor. 2006. The loss of OV order in the history of English. In *Blackwell handbook of the history of English*, ed. A. van Kemenade and B. Los. Blackwell.
- Platzack, Christer. 2000. Multiple interfaces. In *Cognitive Interfaces: Constraints on linking cognitive information*, ed. Emile van der Zee and Urpo Nikanne, 21–53. Oxford: Oxford University Press.
- Richards, Marc. 2004. Object shift and scrambling in North and West Germanic: A case study in symmetrical syntax. Doctoral Dissertation, University of Cambridge, Robinson College, Cambridge, UK.
- Rögnvaldsson, Eiríkur. 1984. Icelandic Word Order and það-insertion. *Working Papers in Scandinavian Syntax* 1–21.
- Rögnvaldsson, Eiríkur. 1987. OV word order in Icelandic. In *Proceedings of the seventh biennial conference of teachers of scandinavian studies in great britain and northern ireland*, 33–49. London: University College, London.
- Saito, Mamoru. 1985. Some asymmetries in japanese and their theoretical consequences. Doctoral Dissertation, Massachusetts Institute of Technology, Cambridge, MA.
- Saito, Mamoru. 1992. Long-distance scrambling in japanese. *Journal of East Asian Linguistics* 1:69–118.
- Saito, Mamoru, and Naoki Fukui. 1998. Order in phrase structure and movement. *Linguistic Inquiry* 29:439–474.

- Santorini, Beatrice. 1989. The generalization of the Verb-Second Constraint in the history of Yiddish. Doctoral Dissertation, University of Pennsylvania.
- Santorini, Beatrice. 1992. Variation and Change in Yiddish Subordinate Clause Word Order. *Natural Language & Linguistic Theory* 10:595–640.
- Santorini, Beatrice. 1993. The rate of phrase structure change in the history of Yiddish. *Language Variation and Change* 5:257–283.
- Santorini, Beatrice. 1997/2008. The Penn Yiddish Corpus. University of Pennsylvania.
For details, contact: beatrice@babel.ling.upenn.edu.
- Sauerland, Uli, and Paul Elbourne. 2002. Total reconstruction, pf movement, and derivational order. *Linguistic Inquiry* 33:283–319.
- Svenonius, Peter, ed. 2000. *The Derivation of OV and VO*. Linguistik Aktuell. Amsterdam: John Benjamins.
- Svenonius, Peter. 2001. On object shift, scrambling, and the PIC. *MIT Working Papers in Linguistics* 39:267–289.
- Taylor, Ann. 1990. Clitics and configurationality in Ancient Greek. Doctoral Dissertation, University of Pennsylvania, Philadelphia.
- Taylor, Ann, Anthony Warner, Susan Pintzuk, and Frank Beths. 2003. The York-Toronto-Helsinki Parsed Corpus of Old English Prose.
- Thráinsson, Höskuldur. 1986. V1, V2, V3 in Icelandic. In *Verb second phenomena in Germanic languages*, ed. Hubert Haider and Martin Prinzhorn. Dordrecht: Foris Publications.
- Thráinsson, Höskuldur. 2001. Object shift and scrambling. In *Handbook of Contemporary Syntactic Theory*, ed. Mark Baltin and Chris Collins, 148–202. Blackwell.
- Vikner, Sten. 2001. Verb movement variation in germanic and optimality theory. Habilitationsschrift, University of Tübingen.
- Wallenberg, Joel C. 2008. English weak pronouns and object shift. In *Proceedings of the 26th West Coast Conference on Formal Linguistics*, ed. Charles B. Chang and Hannah J. Haynie, 489–497. West Coast Conference on Formal Linguistics, University of California, Berkeley: Cascadilla Press.

- Wallenberg, Joel C. 2009. Antisymmetry and the Conservation of C-Command: scrambling and phrase structure in synchronic and diachronic perspective. Doctoral Dissertation, University of Pennsylvania.
- Webelhuth, Gert. 1989. Syntactic saturation phenomena and the modern Germanic languages. Doctoral Dissertation, University of Massachusetts Amherst, Amherst, MA.
- Weinryb, Beier. 1937. A pekl briv in yidish fun 1588, Krake-Prag (a collection of Yiddish letters from 1588, Cracow-Prague). In *Historishe Shriftn fun YIVO (YIVO historical papers)*, ed. E. Tsherikover, volume 2. Vilna: YIVO.
- Zaenen, Annie. 1979. Infinitival Complements in Dutch. In *Papers from the Fifteenth Regional Meeting, CLS*, Chicago Linguistic Society. Chicago: University of Chicago Press.

Diagnostic	Obj, diag. > Vfin	Obj > Vfin > diag.	Vfin > Obj, diag.	Total
Particle	16	0	57	73
Negation	32	0	191	223
Pron. Obj.	NA (16)	0	87	103

Table 1: Clauses with an object preceding the finite (lexical or auxiliary) verb

	Observed		Model Estimate	
	Prt Preceding	Prt Following	Prt Preceding	Prt Following
Obj Preceding	16	0	3.7	12.3
Obj Following	1	57	13.3	44.7

Table 2: Object and particle position relative to finite lexical verbs

	Observed		Model Estimate	
	Neg Preceding	Neg Following	Neg Preceding	Neg Following
Obj Preceding	39	0	8.6	30.4
Obj Following	15	191	45.4	160.6

Table 3: Object and negation position relative to finite lexical and auxiliary verbs

Date	Context	$> V_{fin}$	$V_{fin} >$	Total	Proportion $> V_{fin}$
1500	neg	25	50	75	0.67
-1599	obj	46	71	117	0.61
1600	neg	24	44	68	0.65
-1699	obj	38	71	109	0.65
1700	neg	9	4	13	0.31
-1799	obj	3	4	7	0.57
1800	neg	40	1	41	0.024
-1899	obj	33	1	34	0.029
1900	neg	250	0	250	0
-1993	obj	312	0	312	0

Table 4: Subordinate clauses with finite lexical verbs

	Df	Deviance	Resid. Df	Resid. Dev	p (Chi-square)
NULL			1025	1130.26	
Context	1	1.46	1024	1128.80	0.2269
Year	1	549.94	1023	578.86	$< 2 \times 10^{-16}$
Context:Year	1	0.89	1022	577.97	0.3454

Table 5: Model Comparison, testing Constant Rate Effect

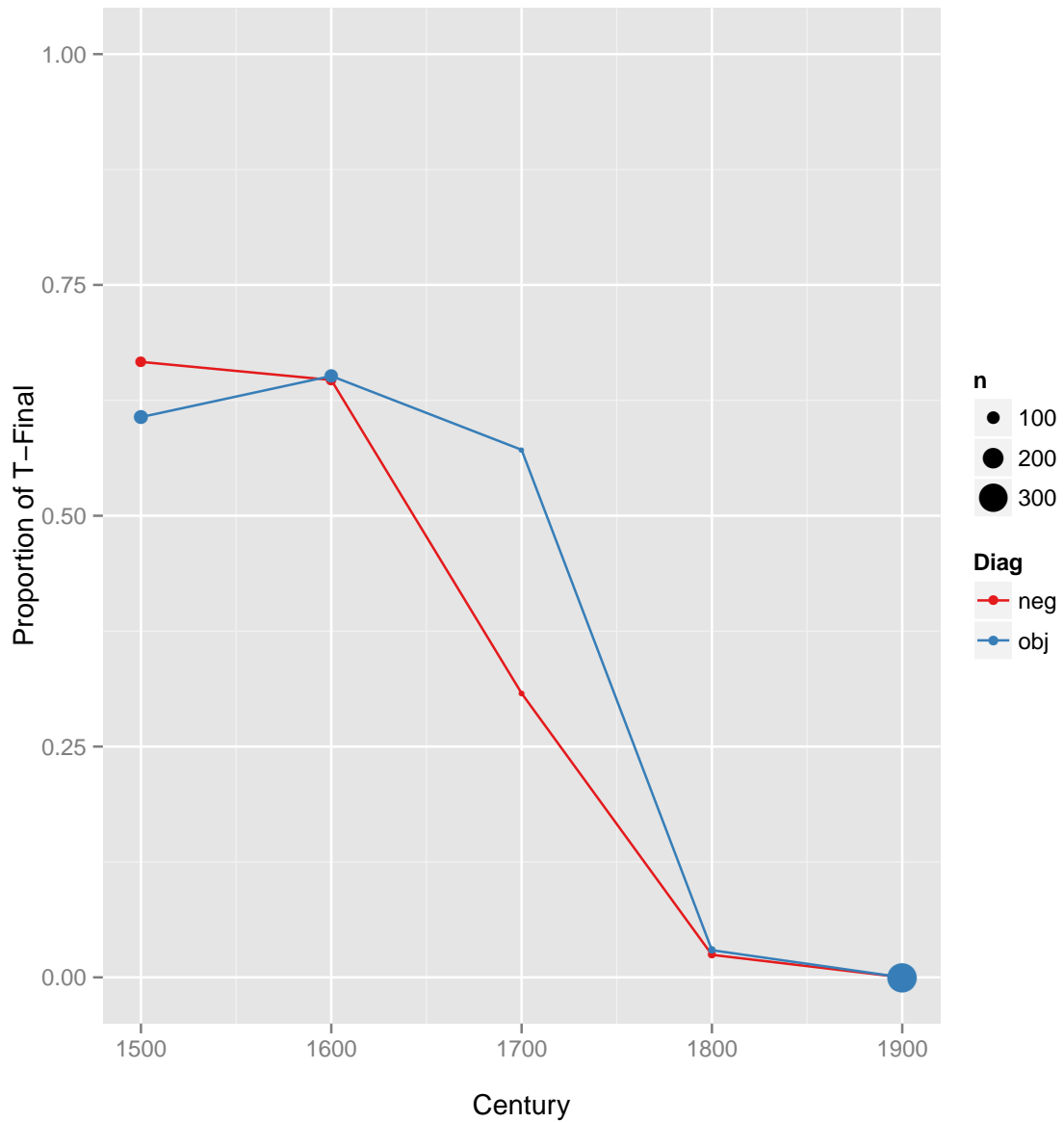


Figure 1: Proportion of Tense-final (finite **neg**ated clauses) and hypothesized Tense-final (clauses with finite lexical verbs and **obj**ects) over time, N per century indicated by dot size.

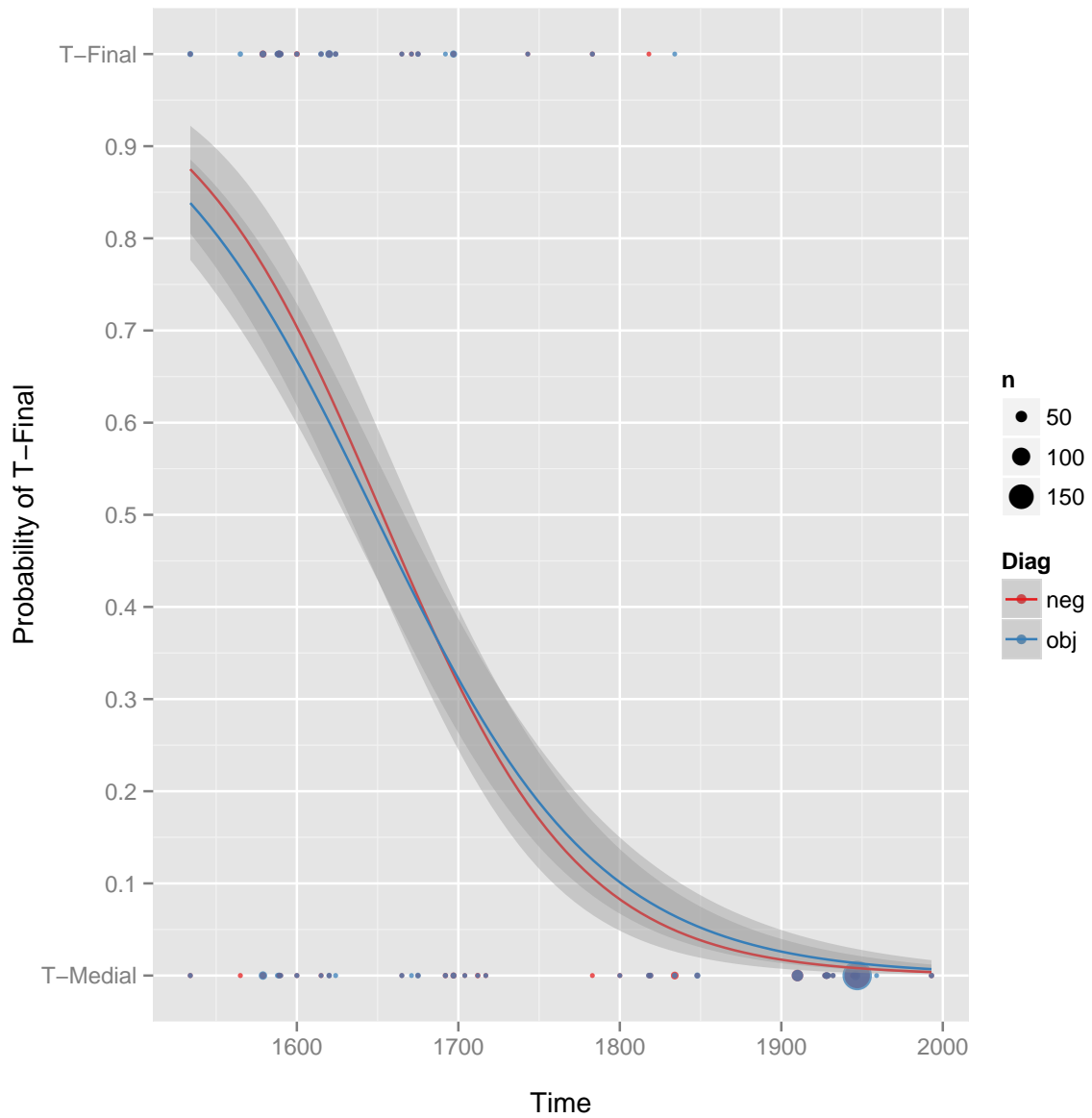


Figure 2: Logistic models for Tense-final (finite **neg**ated clauses) and hypothesized Tense-final (clauses with finite lexical verbs and **obj**ects) over time, N per year indicated by dot size.