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Joanna Nykiel[1]

Abstract

This article considers the forces behind the use of extra prepositions (by way of doubling or inserting a mismatched preposition) in relative and interrogative clause environments in Middle English. The author argues that in that period the explanation lies with both categorical and noncategorical (gradient) factors, with only the latter continuing beyond Middle English and into present-day English. Two noncategorical factors have affected English extra prepositions since the Middle English period: accessibility of *wh*-phrases and semantic connectedness between a verb and preposition. Semantic connectedness favors preposition stranding, while considerations of accessibility favor preposition pied-piping. The former is reflected in a bias toward adjacency of lexicalized units, the latter in a bias toward relative clauses, where the accessibility of a *wh*-phrase is by default low. Together, these findings provide support for lexicalist grammars that accommodate noncategorical constraints.

Keywords

extra prepositions, preposition pied-piping, preposition stranding, Construction Grammar, categorical constraints, gradient constraints, lexicalization

Ever since its formulation in the mid-1950s, generative grammar along with its subsequent revisions has assumed a sharp divide between linguistic knowledge (competence or I-language), defined by Chomsky (1986, 2000) as a certain state of the brain common to all language users, and the use of that knowledge (performance or E-language). Chomsky's position is extremely strong: theories of competence are geared to provide categorical information about well-formedness quite independently of gradient information, which is argued to belong in performance. Although Chomsky initially admitted

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finer-grained distinctions besides the two polar opposites acceptable and unacceptable, he subsequently dismissed them as useless (Wasow, forthcoming).

It is difficult to reconcile Chomsky's perspective with the body of psycholinguistic research indicating that speakers make use of linguistic and nonlinguistic information as it becomes available in the flow of discourse and that there are quantitative differences in the way constructions are affected by various factors.[1] Moreover, some environments may cause degradation in grammaticality, while others improve it, a fact that indicates that grammaticality is gradient (Tanenhaus et al. 1996; Gibson 1998; Wasow 2002; Bresnan 2007). Any formal machinery that eschews such facts suffers from incompleteness and, as Wasow (2002) points out, needs solid justification. A better way forward is to develop theories of linguistic knowledge in which competence and performance are not orthogonal systems but instead interact with each other (Sag & Wasow, forthcoming; Wasow, forthcoming). With such a move comes the possibility of treating both categorical and gradient constraints as internal to linguistic knowledge. As will become clear below, retaining a distinction between these constraints while integrating both into the model of grammar provides finer insight into the classification of English filler-gap constructions. The classification I propose draws on the constructionist view that if a pairing of form and meaning exhibits a mismatch between its function and compositional characteristics, it is seen as a stored construction (see Goldberg 2006).

There is growing recognition that the costs of processing discourse can stretch the limits of acceptability (Gibson 2000; Hawkins 2004; Arregui et al. 2006; Hofmeister et al. 2007; Staum & Sag 2008a, 2008b). Thus, what are grammatical violations from a purely formal perspective may gain in acceptability due to performance considerations. In this article, I investigate the gradience of doubled and mismatched prepositions in Middle English (ME), using as my starting point the evidence offered in a recent study by Staum and Sag (2008b). Staum and Sag discuss experimental data that involve processing redundant material which is ill formed in the Chomskyan sense. Their case studies include redundancy produced by inserting two identical prepositions in a relative clause, as in (1) and (2) below.[2]

(1) They constitute a basis *on* which we can build *on*.
(2) The world *in* which we live *in*.

Such doubling occurs whenever a speaker fails to make a choice between fronting the preposition together with the relative pronoun (pied-piping) and leaving it in situ (preposition stranding), and so ends up doing both. Staum and Sag's (2008b) results challenge the ungrammatical status of these patterns on the locality front: speakers find doubled prepositions better if more material intervenes between them. Consider Staum and Sag's examples in (3) and (4); the number of intervening words is nine and fifteen, respectively.

(3) I asked *from* which teacher my son had gotten the bad grade *from* at the end of the quarter at the new school he attended.

(4) I asked *from* which teacher at the new school he attended my son had gotten the bad grade *from* at the end of the quarter.

Staum and Sag (2008a) suggest that if the doubled elements are close together, violations (doubled prepositions and the complementizer *that*) are generally more visible to speakers, and therefore less acceptable. The lesson we ought to learn from this is, they argue, that the grammar sets the rules, but they may be altered by performance constraints.

Experimental results often parallel those obtained from corpus studies when gradient acceptability is at issue. For example, Bresnan et al. (2007), Bresnan and Nikitina (2007), and Bresnan (forthcoming) demonstrate that syntactic preferences in the dative alternation (*I gave Scott a car* vs. *I gave a car to Scott*) are based on contextual information that involves variables such as pronominality, definiteness, givenness, animacy, and length of argument. These results, coming from corpus studies, closely resemble experimental data produced by speakers' judgments of acceptability given the same kind of contextual information (Bresnan, 2007). From this correspondence, it emerges that the performance-based preferences that Staum and Sag (2008b) obtained from their experiment should also persist in corpus data. But do corpus data indeed support this prediction?

The present article reports on historical material, which may naturally contain accidental gaps or otherwise stop short of representing the period it purports to provide evidence for. However, since testing one's claims against results from various sources is always welcome, our knowledge of preposition placement will doubtless benefit from an investigation into the history of English that follows on Staum and Sag's (2008b) results. Broadly, the investigation offers a novel perspective on ME preposition placement—one that explores the fit between the categorical–gradient distinction and the available data. Extra prepositions in relative and interrogative clauses, by hypothesis, were subject to categorical and gradient constraints when they first arose in English, although the gradient factor was not locality based, that is, related to the number of words coming between two prepositions. It is well known that the phenomenon of extra prepositions is some eight hundred years old (Denison 1985; Fischer 1992; Bergh 1998; Bergh & Seppanen 2000); present-day English (PDE) examples are, therefore, far from an innovation. Rather, what we witness today is in part discontinued and in part continued use of a pattern that has its roots in ME. The failure of continuity shows in the way that the grammar has gradually ceased to play a role. On one hand, extra prepositions were made possible by the changing grammar: preposition stranding and pied-piping began to operate under free variation, enabling speakers to employ both constructions in a single clause. This conclusion follows from the fact that English had no extra prepositions in relative and interrogative clauses before such free variation was admitted.[3] On the other hand, the choice between preposition stranding and pied-piping intersects with a shift toward marking case by means of prepositions. The expected development is for the use of any such transitional construction to discontinue as the grammar stabilizes. In this case, however, gradient factors took over. They have continuously sustained extra prepositions

in relative clauses and in contexts where verb–preposition sequences exhibit semantic connectivity.

The article proceeds as follows. First, I summarize the basic assumptions about preposition placement and the rise of extra prepositions in English relatives and interrogatives. I suggest that preposition placement and extra prepositions are convergent with the framework of Construction Grammar (CxG) on account of the categorical and gradient constraints they are subject to. The next section presents data collected from the *Middle English Compendium* (*MEC*). The data go beyond Staum and Sag's (2008b) in that they span all the attested types of constructions containing *wh*-phrases where extra prepositions occur, that is, relative clauses, free relatives, and interrogative clauses. Furthermore, unlike Staum and Sag, I include both doubled and mismatched prepositions. I begin by exploring the amount of the material intervening between two prepositions, but my focus is on other noncategorical effects and grammatical constraints showing in their use. Finally, I discuss the noncategorical side to extra prepositions, their relationship with preposition stranding and pied-piping, and the consequences for the theory of grammar.

Background

The insertion of extra prepositions requires two steps. First, there is fronting of a preposition so that it precedes a dislocated *wh*-phrase, and then another preposition is left in situ following the verb. These prepositions are often, but need not be, the same. Riley and Parker (1986) note that in PDE relative clauses only a dislocated *wh*-phrase may license extra prepositions because its rival *that* obligatorily strands prepositions. This indicates that since there is a critical interaction between the appearance of extra prepositions and preposition placement, the two may be subject to similar constraints, whether categorical or otherwise.

Beyond Staum and Sag's (2008b) results, research on preposition placement has identified sets of data that motivate preferences for pied-piping or stranding based on the complexity of the relative clause, formality, and the complement–adjunct distinction (Hornstein & Weinberg 1981; Johansson & Geisler 1998; Bergh & Seppanen 2000; Trotta 2000; Hoffman 2005). Of particular interest here is the third criterion, which draws on a verb's argument structure. Although a simple distinction between complement and adjunct is insufficient in itself (Trotta 2000; Hoffman 2005), it still reflects a general tendency for prepositions to pied-pipe with phrases extracted out of adjuncts, but not out of arguments. A prepositional verb and a verb that selects for a prepositional phrase (PP) as its argument, even if optionally left unexpressed (e.g., *sleep in a bed*, *work with someone*), make stranding more likely with the extraction of a *wh*-phrase out of such an argument (Trotta 2000; Hoffman 2005). This tendency has relevance to the use of extra prepositions because, as Riley and Parker (1986) note, in a two-preposition configuration, the stranded one is always what the verb selects for. For the fronted preposition, however, the verb may contribute little or no valence information. In Riley and Parker's (1986:300) data, the fronted preposition,

when mismatched, is usually *in* as in (5), but the forces behind inserting it remain unexplained.

(5) the organization *in* which a person is affiliated *with*.

It is possible that, like preposition stranding, extra prepositions are sensitive to the strength of a lexical connection between a verb and a PP that follows it: the stronger the connection, the stronger the tendency of preserving the proximity and linear order of the elements. Brinton and Traugott (2005) argue that verb–preposition sequences have undergone a decrease in compositionality, becoming lexicalized units. This view is firmly entrenched in CxG, which makes reference to form-meaning pairs (constructions) and their contexts of use (Fillmore 1985; Croft 2001; Kay 2002; Goldberg 2006; Trousdale 2008; Traugott 2008). Constructions range over words, phrases, and sentences characterized by reduced compositionality, which in general constitute a "cline of linguistic phenomena from the more idiomatic to the more abstract and general" (Goldberg & Bencini 2005: 3). Constructionist approaches address the form, semantics, and distribution of particular constructions, making it possible to account for constructional change by simultaneous appeal to all three features. Furthermore, some approaches recognize networks of constructions formed on the basis of their level of schematicity. Macro constructions, the most schematic level, include meso constructions; these in turn include micro constructions. The smallest unit is a construct—a recorded token of a micro construction (Traugott 2007, 2008; Trousdale 2008). Relative and interrogative clauses where preposition stranding occurs may be considered as constructions because it is only prepositions showing a semantic bond with verbs that tend to strand. I examine the constructional features of ME extra prepositions, with an emphasis on their contexts of use, in the sections below.

Since the development of prepositional verbs is easily traceable in English, and since the spread of preposition stranding in relative and interrogative clauses bears on the rise of extra prepositions, it is useful first to consider how the rise of extra prepositions interacts with both these factors and the transition from Old English (OE) to ME.

In the thirteenth century another strategy for forming *wh*-interrogatives and relatives was introduced, a development that made the use of extra prepositions possible. Prior to that, interrogatives required pied-piping (example (6)), while relatives (all of them non-*wh* except for free relatives) allowed either pied-piping or preposition stranding (examples (7) and (8)), based on the choice of relative marker (Allen 1980; van Kemenade 1987; Fischer 1992).

(6) To hwæm locige ic buton to ðæm eaðmodum?
to whom look I but to the humble
'To whom shall I look but to the humble?' (CP Sweet p. 299.19, cited in Allen 1980:285)

(7) ðæt he us ðingige wið ðone Heofonlican Cyning, for ðæs naman he
that he us intercede with the Heavenly King for whose name he
suffered
'that he intercede for us with the Heavenly King, for whose name he suffered.' (Alc. Th. vol. I, p. 434.35, cited in Allen 1980:270)

(8) Ac he sylf asmeade ða up-ahefednysse ðe he ðurh ahreas
but he self devised the presumption that he through fell
'But he himself thought up the presumption that he fell through.' (Alc. Th. vol. I, p. 192.17, cited in Allen 1980:267)

Because *wh*-phrases only started to appear in relatives in early ME deriving from OE free relatives, which stranded their prepositions, they likely transferred the stranding possibility to relatives (Fischer 1992:391). But there are still more factors that may have contributed toward a general spread of preposition stranding and the emergence of extra prepositions in ME.

In the history of English, the shift from synthetic forms toward analytic forms helped produce prepositional verbs out of former prefixed verbs (P-V compounds), for example, *besprecan* 'speak about,' *ætsittan* 'sit by' (Denison 1985, 1993; Fischer 1992; Traugott 1999; Goh 2001; Brinton & Traugott 2005). The new V-P sequences interacted with a change from SOV to SVO order and a reanalysis of (9) as (10), which strengthened the unity of these sequences early on (Fischer 1992). This reanalysis in fact marks the beginning of the lexicalization of V-P sequences.

(9) V-[P-NP]
(10) [V-P]-NP

Support for the reanalysis comes from Denison (1985:128-129). Object sharing under ellipsis, as in (11) and (12), indicates the unity of a verb and its preposition.

(11) ðær he geseah Godes englas & wið spræc
where/there he saw God's angels and with spoke
'Where he saw God's angels and spoke with them.' (*WHom* 15.15)

(12) þar lauerd liggeþ & lauedi | Ich schal heom singe & sitte bi.
where lord lies and lady I shall them sing and sit by
'Where lord and lady lie, I shall sing to them and sit near by.' (c.1250 *Owl and N.* 959)

As (11) shows, ellipsis along these lines was already operative in OE, favoring the concept and use of a prepositional verb later on.

Some of the topicalization data offered by Bergh (1998:8) seem to provide support for the reanalysis affecting preposition stranding and, by extension, the use of extra prepositions. Consider (13) and (14) below.

(13) inne on þæm fæstenne sæton feawa cirlisce men on
in on the stronghold sat feawer church men on
'in on the stronghold sat fewer men of the church' (*Chronicle A*, 884)
(14) Of love were liking of to here
'Of love wished to hear' (c.1185 *Ipomedon*)

While an investigation into preposition doubling outside of *wh*-clauses is beyond the scope of this article, examples (13) and (14) suggest that preposition doubling somewhat preceded the introduction of preposition stranding with *wh*-phrases but may have roughly coincided with the reanalysis itself—at least as far as one can tell from Bergh's examples. It is important to note that although OE topicalization admitted both preposition pied-piping and stranding, one out of five of Bergh's examples exhibits adjacency of the verbs and prepositions. Therefore, it is difficult to see in Bergh's examples any real support for the reanalysis.

Besides the high frequency of P-V sequences, there is a general increase in the use of prepositions in ME. Intuitively, the increase simply lies in the breakdown of the OE case system tied to the spread of analytic forms: as morphological information in the noun decreases, it is transferred to other carriers. But this explanation oversimplifies the situation. According to Allen (1995), objects in late OE could already be assigned lexical (selected for by lexical items) or structural (determined by an object's syntactic role) case, a fact that existed independently of the subsequent loss of case distinctions. For example, while the dative–accusative distinction persisted, genitive objects alternated not only with prepositional but also accusative objects. This alternation, Allen argues, is symptomatic of the weakening of lexical case marking and its impending replacement by structural case, since both the accusative and PPs are instances of structural case. With the dative–accusative distinction losing ground and ultimately lost by the fourteenth century, speakers had no tangible evidence left of lexical case. Hence, objects overtly marked for genitive case disappeared, too. Anticipating somewhat my later argument, my focus here is squarely on two cases found to be critical in the ME data: the genitive and dative, both replaceable by prepositional objects.

In discussing the genitive case, it is relevant to consider which types underwent replacement by PPs (*of* genitive). Investigations into prenominal and postnominal genitives have shown that it is the latter—a category that essentially includes the partitive genitive illustrated in (15) and (16) below (Allen 1998; Koike 2006).

(15) hwuch ure is kempe which our is victor
'which of us is the victor' (*St.Kat.* 31.201, cited in Allen 1998)
(16) & fela othre godre cnihte
and many other(GP) good(GP) knights(G)
'And many other good knights' (*Peterborough Chronicle* 1124, cited in Allen 1998)

This change reflects the loss of postnominal genitives, while some prenominal ones continued into late ME, accompanied by a steep increase in the frequency of the *of* genitive (Thomas 1931). The partitive genitive is the last postnominal type to disappear from English, although its use does not extend beyond the thirteenth century (Allen 1998). Hence, it makes sense to assume that phrases headed by the preposition *of* that appear already in fourteenth-century texts are, if unsubcategorized for by the verb, the new equivalents of the former postnominal (and likely partitive) genitive.

Studies of the analytic dative in ME reveal that its occurrence is partly associated with information structure (Nagel 1909; Fischer 1992; Fischer et al. 2000).

(17) Betir is that Y ȝyue hir to thee than to another man
'It is better if I give her to you than to another man.' (*WBible* Genesis 29:19, cited in Fischer et al. 2000:74)

The probability of using the analytic dative increases when the indirect object is animate, is a noun, or has been dislocated from its postverbal position. This latter effect is operative by default in the data considered here, for they include relative and interrogative clauses. I take these facts to play a role in the production of extra prepositions and return to them in the next section.

Overall, the ME changes detailed above are reflected in constructions, such as the prepositional passive (18), and old ones with a now-extended application, that is, the topicalization of full NPs (19), *wh*-relatives (20), and *wh*-interrogatives (21), which can all strand prepositions.

(18) heo shal beo greattre ibollen, leafdiluker leoten of þen a leafdi
hames of she shall be greater honored, more ladylike thought of than a lady of home
'She shall be honored more, thought of more as a lady than a housewife.' (c.1230 *Ancrene Wisse* 58, 7, cited in van Kemenade 1987:208)

(19) Ah ðe gode ich ga aa bisiliche abuten But the good I go ever busily about
'But I always diligently pursue the good.' (13c. *The life of St Margaret*, 30, 35, cited in van Kemenade 1987:208)

(20) And getenisse men ben in ebron, quilc men mai get wundren on
and giant men are in Hebron, which men may yet wonder at
(c.1250 *Genesis and Exodus*, cited in van Kemenade 1987:208)

(21) Nuste nan kempe whæm he sculde slæn on
not-knew no soldier whom he should strike on
'No soldier knew whom he should strike at.' (c.1205 *Layamon's Brut*, cited in van Kemenade 1987:208)

Among the factors that facilitated the emergence of extra prepositions, the word order change from SOV to SVO coupled with the reanalysis of a verb and preposition

as a unit is, as Bergh (1998) proposes, responsible for a mismatch between a semantic and syntactic constraint: the former would have a preposition close to the verb, while the latter close to the object. As soon as preposition stranding provides a formal way of following the semantic constraint, both can be satisfied at once. Although entirely sound, Bergh's argument does not account for the persistence of extra prepositions as the new rules become increasingly fixed, nor does Bergh (1998:11) consider cases of mismatched prepositions, whose existence is only acknowledged in a footnote. Since the few examples of mismatched prepositions I found seem to follow from the ME use of prepositions to track reference as overt case marking breaks down, they suggest that doubled prepositions are partly supported by the same mechanism. If this reasoning is correct, the question arises why extra prepositions never faded into disuse along with this reference-tracking practice. Furthermore, Bergh's account holds no explicit clues as to whether early extra prepositions were influenced by any gradient constraints; it seems to imply, however, that they were strictly part of the changing grammar. With this background, I turn to the ME data in the next section.

Extra Prepositions in ME

This study uses the Corpus of Middle English Prose and Verse (available from *MEC*), made available by the University of Michigan. I extracted all clauses immediately dominated by a *wh*-phrase, with all the spelling variants included. Examples whose *wh*-phrases followed prepositions were selected next. Extra prepositions were identified by inspecting all the extracted clauses to see if another preposition, doubled or mismatched, followed the verbs. Finally, in separating doubled from mismatched prepositions, I relied on both formal and semantic criteria. For example, the prepositions *to* and *unto* were treated as doubled ones since *to* is semantically and formally part of *unto.* Where the difference was due to spelling (*in* vs. *on, yn* vs. *ynne*), the prepositions were similarly categorized as doubled.

In this section, I first consider the compatibility of the ME data with Staum and Sag's (2008b) argument. Specifically, I inspect the amount of the material intervening between two prepositions in both doubled and mismatched cases. Next, I address the categorical aspects of extra prepositions, showing that they fail to explain the continued existence of these prepositions. Finally, I provide ME data that arguably show noncategorical effects, such as a preference for relative clauses and semantic links between a verb and a postverbal PP.

Testing Distance between Two Prepositions as a Factor

There is little, if any, support for an interaction between locality and extra prepositions. The distance between the doubled prepositions ranges from three (22) to twelve (23) words, while that between the mismatched prepositions (of which there are only three examples) is either four (24) or five (25).

(22) Til þat the knyght *of* which I speke *of* thus . . .
'Until the knight who I speak of thus . . .' (14c. Ellesmere ms of Chaucer's *Canterbury Tales*)

(23) Than awayte þou redily *in* what degree of þe zodiak þat þe mone at þat tyme is *ynne*.
'Wait readily and see what degree of the zodiac the moon is in.' (14c. *Treatise on the Astrolabe*)

(24) he made the clothis, *with* whiche Aaron was clothid *yn*,
'he made the clothes in which Aaron was dressed.' (14c. *Holy Bible* Exodus 39:1)

(25) there been two flagons hangyng on the sadle of my hors whyche ben full of the bawme that I conquered in Iherusalem, & it is the same *of* whyche your god was enbawmed *wyth* whan he was taken doun fro the crosse and layed in hys graue.
'There are two flagons hanging from the saddle of my horse, which are full of the balm that I came by in Jerusalem. It is the same (balm) with a drop/ some of which your god was anointed when he was taken down from the cross and lain in his grave.' (15c. *Lyf of the noble and Crysten prynce, Charles the Grete*)

There is a tendency for extra prepositions separated by longer distances to have the lowest frequencies in the corpus—the reverse of what Staum and Sag (2008b) argue for—as shown in Figure 1 below. It gives the distribution of identical prepositions, which total 124.

The mismatched prepositions are too few to deserve a figure: the distance is four words in two instances and five words in the third. Here, I give the total number of instances of mismatched prepositions as three, but, as we will see below, two of them are potentially subject to a different treatment.

Locality does not emerge as a clear predictor of extra prepositions. This conclusion is reinforced by the fact that at a time when a preposition may either follow or precede its governing verb in a stranding configuration, the latter position has the effect of reducing the distance between two prepositions. Evidence for such a move comes from four examples, two of which are given in (26) and (27).

(26) So ful he was of tresoun. Þabot *of* whom ich er *of* teld,
'So full was he of treachery. The abbot about whom I told (you) before' (14c. *The romance of Guy of Warwick*)

(27) A lytyll clothe lyethe there too, *of* whiche cryst was fyrste *in* do of his modyr, whan he was bore
'A little cloth lies there too, in a piece of which Christ was first wrapped by his mother, when he was born.' (15c. *Political, religious, and love poems*)

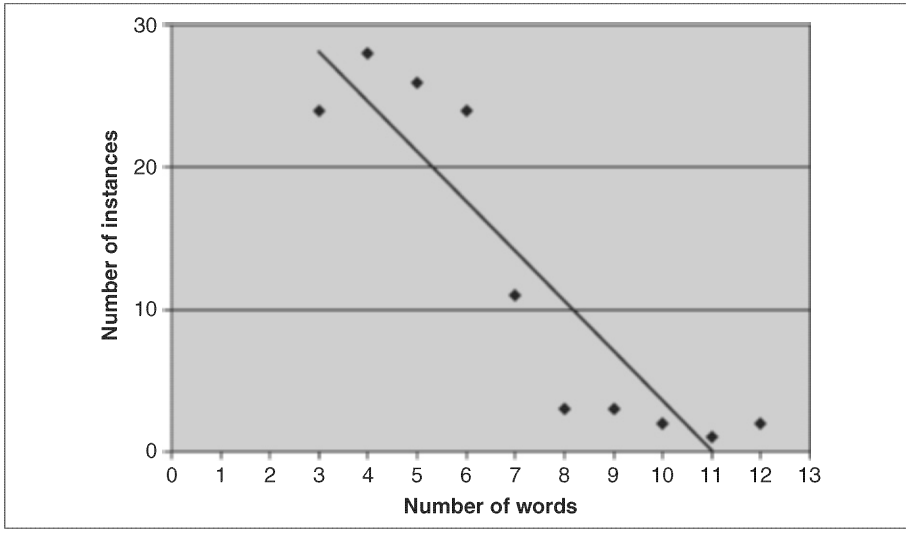

Figure 1. Distance between two prepositions

It is difficult to reconcile an optional ordering along these lines with Staum and Sag's (2008b) results for PDE. There is then little indication of gradient constraints in this respect. This raises the question of whether gradient constraints are involved at all, which is addressed below.

Involvement of Categorical Constraints

The rise of doubled prepositions—seemingly the default for extra prepositions in the ME data (124 out of 127 instances)—may indeed be partly accounted for by appeal to word order changes and the reanalysis in (9), as proposed by Bergh (1998). However, this proposal has nothing to say about mismatched prepositions. Riley and Parker (1986) note that, while a subcategorization link exists between a governing verb and a stranded preposition in PDE, a fronted preposition can be a somewhat puzzling addition, unless it is identical to the stranded one. Pied-piping and stranding a preposition in a single clause show no more than that, for whatever reason, a speaker has chosen to explicitly link the preposition to both the *wh*-phrase and the verb. But if there is a mismatch between the pied-piped preposition and the stranded one, something usually regulates the use of the former. Thus, cases of mismatch are of more theoretical interest than those of doubling. I suggest that the three examples of mismatches, few as they are, hold some answers. First consider (24), repeated for convenience as (28).

(28) he made the clothis, *with* whiche Aaron was clothid *yn*,
'he made the clothes in which Aaron was dressed.' (14c. *Holy Bible* Exodus 39:1)

This example is driven by the grammar to the extent that the verb subcategorizes for two prepositions (cf. *MEC*), both of which appear in the clause. This fact offers one kind of motivation for the choice of a preposition to front. Even this example, though, leaves us with the question of why the two alternatives would be used in a single clause.

The next two examples suggest that the insertion of a preposition preceding a relative maker is purposeful. (Examples (25) and (27) above are repeated here as (29) and (30), respectively.)

(29) there been two flagons hangyng on the sadle of my hors whyche ben full of the bawme that I conquered in Iherusalem, & it is the same *of* whyche your god was enbawmed *wyth* whan he was taken doun fro the crosse and layed in hys graue.
'There are two flagons hanging from the saddle of my horse, which are full of the balm that I came by in Jerusalem. It is the same (balm) with a drop/some of which your god was anointed when he was taken down from the cross and lain in his grave.' (15c. *Lyf of the noble and Crysten prynce, Charles the Grete*)

(30) A lytyll clothe lyethe there too, *of* whiche cryst was fyrste *in* do of his modyr, whan he was bore
'A little cloth lies there too, in a piece of which Christ was first wrapped by his mother, when he was born.' (15c. *Political, religious, and love poems*)

In light of the replacement of postnominal genitives with periphrastic genitives, the preposition *of* in both (29) and (30) may signal the partitive genitive. To see why, consider that the verbs *do in* and *do of* in (30) carry the respective meanings of *place in* and *remove*. Because the latter meaning is incompatible with the context, the preposition *of* cannot be subcategorized for by the verb *do*. Furthermore, the verb *do in* selects for the accusative (as far as it is possible to tell the accusative and the dative apart, even in late OE). Historically, the PP in (30) may be the remnant of a binominal construction such as *a piece of which*, where the head NP was lost. Because this construction has the function of an accusative object, the genitive (an *of*-phrase) will be subcategorized by the verbs that formerly took the accusative (Kuryłowicz 1964:185, cited in Lass 1994:236). As an object, the genitive carries a partitive meaning in the sense that it gets only "partly affected" by the action expressed by the verb that governs it, as further illustrated in (31) and (32) (Lass 1994:237; *MEC*).[4]

(31) hwa se euer wule habbe lot wið þe *of* þi blisse: he mot deale
who ever will have a share with you of your bliss, he must share
wið þe of þine pine on eorþe with you of your suffering on earth
'Whoever wishes to share in your happiness, must share in your suffering on earth.' (*O. E. Hom.* I. 187; Lass 1994:237)

(32) wherof the kynge was right wele content, and reseyued hym *of* his hous.
'With which the king was pleased, and he received him in his house.' (15c. *Blanchardyn*, 75/5; Lass 1994:237)

Similarly, it is quite plausible that the prepositional object in (29), the balm, gets only "partly affected" by the act of anointing. The partitive genitive gives the impression of a mismatch between the preposition that strands and the one that pied-pipes in (29) and (30), but there in fact is no pied-piping. If the preposition *of* marks the case required by the prepositional verbs *do in* and *be embawmed with*, it has not been pied-piped. The pairs of prepositions are best analyzed at different levels: *of* in both clauses is simply due to case syncretism, while *in* and *wyth* are subcategorized for by the respective verbs, and stranded. This shows that the status of (29) and (30) is different from that of (28) above.

Another example, provided in Bergh (1998:11), illustrates the use of the dative producing cases of seemingly mismatched prepositions.

(33) This mocke muste my fadre here of hym *to* whom he had most his trust *on*
'This much my father must hear about the one he trusts most (15c. *The History of Reynard the Fox*. W. Caxton)

I propose that here the extra preposition (*to*) is an analytic realization of the dative case required by the entire complex predicate (*to have trust on*). The sentence involves stranding, but not pied-piping, of the preposition dependent on the predicate *to have trust*.[5] This analysis is fully in line with what we know about early English case assignment. The preposition *on* with the meaning of "static location" governs the dative (Lass 1994; Fischer et al. 2000), as do "verbs of serving, confiding, trusting" (Lass 1994:238). Because the interpretations of examples (29)-(30) and (33) are highly convergent with the shift toward analytic forms and the loss of lexical case marking discussed above, it is possible that all pied-piped prepositions, whether doubled or mismatched, serve some kind of reference-tracking purpose beyond simply indicating speakers' intention of simultaneously satisfying two kinds of preposition placement.[6] Note also that as long as preposition stranding applies only to relative clauses containing relative markers that are never marked for case (Allen 1980; van Kemenade 1987), no redundant prepositions ever pied-pipe with those markers.

The involvement of categorical constraints in the ME data receives further support from the rise of preposition stranding in *wh*-relatives and interrogative clauses, which coincides with the rise of extra prepositions. Recall that according to Allen (1980), prepositions always pied-piped in OE *wh*-interrogatives, but they either pied-piped or stranded in relative clauses, depending on the relative marker. The only environments that offered free choice between pied-piping and stranding were topicalization, free relatives, and relative clauses headed by locative pronouns. Pied-piping was, however, required if case was overtly marked on a prepositional complement (Allen 1980; van Kemenade 1987; Fischer 1992). The history of English has seen changes followed by usually temporary coexistence of old and new characteristics. One such

example is the reanalysis of OE premodal verbs as modal auxiliaries, with gradual loss of the regular-verb features (Warner 1993; Harris & Campbell 1995; Harris 2003). Another is the rise of *do*-support, which gradually, rather than instantaneously, extended to groups of verbs, producing much variation along the way (Salmon 1987; Nevalainen 2006). These cases are independent clauses that sometimes show new features, and at other times old ones. But new and old features may appear in parallel. Nagle (1989:77-78) notes that ME modals, just when they were losing the ability to take the *to*-infinitive, appeared in constructions in which both the bare infinitive and the *to*-infinitive followed, as in (34).

(34) She wold haue ranne vpon the swerd and *to* haue slayne herself. (1470-85 Mallory, M. d'Arthur (Sommer) 368, 34)

Similarly, van Gelderen (2006) points out examples of doubled comparatives in Early Modern English, for example, *most vnkindest*, *more better*, which could simply be an indication of competing pressures in the grammar on its way toward analyticity. Although there is nothing unusual about the appearance of such features, they normally run their course: just as the grammar stabilizes, so competing pressures get resolved one way or another. In the absence of alternative sources of evidence, the ME data reveal a pattern of results that strongly resembles a transitory phenomenon, though one that, surprisingly, has lingered on ever since. Clearly, the intersection of preposition stranding in *wh*-relative clauses and the rise of extra prepositions show that the grammar initiated, or at a minimum was involved in, the use of the latter. However, it cannot be the force behind its persistence in later English because there is no grammar-driven requirement of overt case marking on extracted *wh*-phrases anymore. At issue here is the identification of that force, along with its categorization; is it possible that some noncategorical factors have supported extra prepositions since ME?

Gradient Data

This section offers a reexamination of the ME data, which have, to my knowledge, been interpreted only as governed by the grammar. There are two reasons for this reexamination. First, the use of extra prepositions reflects an intimate connection between a verb and a following PP. Put another way, a PP is always dependent on the verb for its interpretability. Decisions about such a dependency are made based on the Pro-verb Entailment Test, suggested by Hawkins (2004:114): "Can a V be replaced by some general Pro-V [*do something*] or does one of the PPs require that particular V for its interpretation?" The impossibility of replacement means dependence or semantic connectedness. In the ME data, although the majority of constructions appear only once, some are statistically dominant: *speak of* (19 percent), *be in* expressing location or condition (15 percent), *come/go to* expressing destination (6 percent), *come of* expressing origin (4 percent). Applying Hawkins's test to them (*to speak of something ≠ to do something of it*), we get connectedness effects that favor the proximity of

a verb and the preposition dependent on it, while another preposition pied-pipes with a *wh*-phrase. This semantic effect may be correlated with lexicalization and degrees thereof, as discussed by Brinton and Traugott (2005). The reanalysis given in (9) and (10) enables further unification of a verb and preposition: once OE prefixed verbs had turned into verb–preposition sequences, their subsequent development could be characterized as a shift toward fusion of the verb and the preposition so that they become unanalyzable units. The shift produces units that exhibit a scale of lexicalization: from free to fixed combinations. The general movement is toward nonproductive use (Huddleston & Pullum 2002; Brinton & Traugott 2005). Of course, collapsing the ME examples with already lexicalized units may be premature, but since some combinations are more frequent than others, they have stronger mental representations and are becoming entrenched. This in turn, through advancing fusion, affects preposition placement. Furthermore, pace Fischer (1992), we find stranding not just with combinations akin to prepositional verbs (*speak of*) but also with verbs that are more loosely connected to a PP (*be taken to* + NP, *go together with* + NP) where the PP is part of the verb's argument structure. These data thus show overall sensitivity to a verb's argument structure, as does modern English.

Experimental results demonstrate that semantic dependence plays a significant role in the ordering of postverbal constituents: a preposition that the verb is semantically connected to is more likely to be adjacent to it (Hawkins 2000, 2004; Wasow 2002; Lohse, Hawkins, & Wasow 2004). Not surprisingly, preposition placement is just as susceptible to such semantic connectedness.

The other kind of evidence in support of the existence of gradient data comes from the distribution of clause types. There is a strong bias toward relatives instantiated by 94 examples out of 127. The remaining examples are interrogative clauses. Because both types are filler-gap dependencies, the extracted *wh*-phrases should be easier to process if they are more accessible (i.e., phonologically, syntactically, and semantically rich), as predicted by the *wh*-processing hypothesis (Arnon et al. 2005). A complex *wh*-phrase will therefore be more accessible than a bare one. Note that in relative clauses, unlike in interrogatives ones, *wh*-phrases have only one way of increasing their level of complexity: pied-piping their prepositions. Both these patterns predict that linguistic knowledge is in part quantitative, allowing constructions unacceptable in categorical terms to persist in the system if they serve to reduce processing difficulty. The next section addresses the consequences of these findings for theories of grammar along with suggestions for further research.

Discussion and Suggestions for Further Research

This section considers the question of whether extra prepositions have a clear line of descent and, closely related to this question, the distinction between categorical and gradient grammatical constraints. I first clarify why the two factors discussed in the previous section are interpreted as satisfying processing constraints (or performance preferences).

In showing how performance preferences inform grammar, Hawkins (2004:31) formulates three efficiency principles, one of which bears directly on my argument here. This principle is given in (35).

(35) Minimize Domains (MiD)
The human processor prefers to minimize the connected sequences of linguistic forms and their conventionally associated syntactic and semantic properties in which relations of combination and/or dependency are processed. The degree of this preference is proportional to the number of relations whose domains can be minimized in competing sequences or structures, and to the extent of the minimization difference in each domain.

Provided some semantic link (degree of lexicalization) exists between the two elements in a verb–preposition configuration, separating the preposition from the verb through pied-piping it with a *wh*-phrase would cause the domain to grow. Similarly, the processing costs would be greater. Therefore, preposition stranding in these configurations facilitates language processing.

An interesting fact of PDE is that doubled prepositions are not only associated with relative and interrogative clauses. An intervening adverb may lead to repetition of prepositions within a VP or NP (Liberman 2007), as in (36) to (38).

(36) The terrain consists *of* largely *of* rolling piedmont hills.
(37) Credit cards came along *in* mostly *in* the 1970s.
(38) This page started out as a collection of pictures *of* mostly *of* abandoned lines in the Bruce Peninsula.

Clearly, locality is not an appropriate explanation here. For many of Liberman's examples, the prepositions depend on the verbs or nouns. Eleven prepositions are consistent with Hawkins's test of semantic connectedness, while nine are not. The most frequent string is *consist of mostly of* (four instances), and strikingly, constructions that contain this very string along with doubled prepositions are used cross-linguistically (Nykiel 2009). A Google search for this string (10 September 2008) turned up 517 hits for English, 74 for Danish, 259 for Polish, and 107 for German, the latter two being case-marking languages. This pattern is also independent of the possibility of preposition stranding (neither Polish nor German allow it), so it cannot simply be a return to case marking in English. Notice that the usual order is *consist mostly of*, because the reverse, *consist of mostly*, changes the scope of *mostly*. Hence, the preposition gets attracted by the verb due to its semantic relationship with it. It would be worthwhile to further investigate the robustness of this effect in the production of extra prepositions in PDE—not least because the ME data display a similar pattern.

The second effect observed, the bias toward relative clauses, derives from language processing as well. It is assumed that for every relative clause, the filler-gap

dependency is a strain on processing, which, however, decreases with the degree of accessibility of the filler. That is, a complex *wh*-phrase will be processed faster than a bare one (Arnon et al. 2005; Hofmeister et al. 2007). Consider the complex *Which employee* and the bare *Who* in (39) below.

(39) Which employee/Who did Albert learn whether they dismissed after the annual performance reviews? (Hofmeister et al. 2007:5)

A strategy like this is available in interrogative but not relative clauses, though. I propose that in the latter, doubled prepositions serve to signal the function of an extracted *wh*-phrase (subjective vs. objective), facilitating unique identification of filler-gap pairs. Hawkins (2004:204) formulates a *wh*-movement generalization that predicts that a *wh*-filler precedes its gap and, when encountered, seeks to maximize the search for the gap. With a preposition pied-piped with a *wh*-phrase, the human parser knows to look for the verb. Through preposition doubling, both this generalization and MiD are satisfied. Recall, however, that Riley and Parker's (1986) results show that a fronted preposition in PDE, when mismatched, is vaguely related to or independent of the verb's argument structure. Here too, the identification of filler-gap pairs may be maximized by signaling the function of a *wh*-phrase. This task may be performed by any preposition that is compatible with an objective reading. Alternatively, the preposition will be a high-frequency item that appears in a variety of verb subcategorizations (Riley & Parker 1986). Thus, it could be that relatives have their own way of reducing processing costs.[7] This preference could be investigated further. In an experiment that provides both relative and interrogative clause material, we could test whether relative clauses favor extra prepositions. Also testable would be the influence of locality (if any) on the use of mismatched prepositions. Perhaps the longer the distance, the more likelihood there is of including a function marker of the *wh*-phrase.

There is one further predictor of preposition placement that is gradient: pied-piping is often characterized by a high degree of formality of the text it is embedded in. The examples of preposition doubling in (40) and (41), which I came across online, seem to meet this criterion.

(40) Q. I have a problem with a colleague *with* whom I work *with* quite often. We are engineers in the same department and we are frequently paired to do projects or assignments. (http://www.boston.com/jobs/news/articles/2008/04/04/ face_to_face_needed_with_co_worker_over_bid_to_gain_bosss_favor/)

(41) Applicants are encouraged to identify a sponsor *with* whom they are not currently working *with*. (http://www3.imperial.ac.uk/juniorresearchfellowships/informationforapplicants

In accounting for preposition doubling here, it is difficult to tease apart the factors of formality and semantic connectedness. Rather, a conflation of both seems to be the case. This is less problematic for the ME data, though, because the formal–informal distinction is unverifiable to the extent that the available texts are mostly formal.

A closer look at the distribution of extra prepositions in ME offers not only evidence that there is a division of labor between categorical and gradient constraints early on but also an explanation for the persistence of extra prepositions in English. After the ME period, the kinds of extra prepositions that remain are instances of doubling and of mismatch where the first preposition is usually *in* (Riley & Parker 1986) and sometimes *for* or *with*. These prepositions, I think, only serve to maximize the processing of filler-gap constructions, for their presence is no longer supported by the grammar, while MiD continues to motivate speakers to insert stranded prepositions. This result suggests that the use of extra prepositions both is and is not a continuum. A theoretical model for such data needs to allow not only for an interaction between a categorical and gradient component but also for their changing proportions. Furthermore, constructions containing extra prepositions and a number of other constructions discussed in the literature (e.g., dative alternation, heavy noun phrase shift, verb phrase ellipsis, filler-gap dependencies, and verb particles) all function with like effect. Their acceptability is not categorical but rather makes reference to quantitative information, which raises the issue of what kind of knowledge constitutes our knowledge of language. Much research has recently shown that noncategorical mechanisms enter into an interaction with the linguistic faculty to produce structures occurring in natural discourse (Wasow 2002, forthcoming; Arregui et al. 2006; Bresnan & Nikitina 2007; Staum & Sag 2008a, 2008b; Bresnan, 2007). This insight holds of extra prepositions as well.

Preposition placement is a consideration characteristic of filler-gap constructions and subject to the two (and possibly more) gradient constraints discussed above, on top of the categorical choice between preposition stranding and pied-piping. The insertion of extra prepositions (hence, violation of the categorical choice) has the benefit of satisfying both gradient constraints to ease the processing costs. In addition, the gradient factors available for predicting extra prepositions are a near-perfect match for those available for predicting preposition stranding. Neither extra prepositions nor preposition stranding are likely to appear without semantic connectedness obtaining between a verb and preposition. There is no match between extra prepositions and pied-piping in gradient terms unless the preference for semantic connectedness is also satisfied. From a categorical perspective, while extra prepositions overlap with preposition stranding only when a *wh*-pronoun serves as a relative marker, they pattern exactly the same as pied-piping. It is easy to see that if categorical constraints did not exist, nothing would prevent extra prepositions from occurring in *that*-clauses; but the categorical perspective wrongly predicts that extra prepositions appear in any *wh*-relative or interrogative clause. Since these distributional patterns render the function of clauses containing extra prepositions unpredictable from their component parts, they strongly suggest adopting a constructionist framework. One way of capturing the

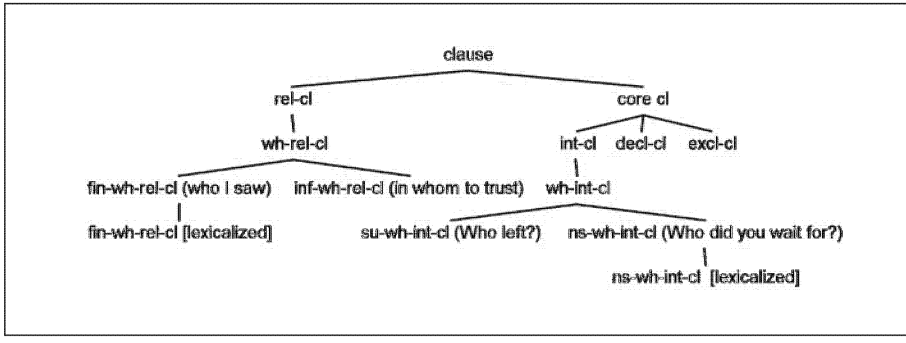

Figure 2. Partial classification of English constructions
Source: Adapted from Sag (2009), forthcoming.

generalizations we saw is by categorizing finite *wh*-relative clauses and nonsubject *wh*-interrogative clauses that favor preposition stranding as stored constructions marked by the feature [lexicalized] (Figure 2). This category includes constructions with single and extra prepositions, and collapsing them this way reflects the noncategorical constraints that both obey, with input from the categorical component of the grammar. Hence, through distinguishing between categorical and noncategorical factors, we arrive at a more detailed classification of filler-gap constructions than is otherwise available.

Change affecting constructions with extra prepositions should have an explanation in terms of ongoing lexicalization of V-P combinations. That is, combinations representing lower points of the lexicalization scale (i.e., free combinations, such as *cry in* [*a professor's office*]) should be incompatible with extra prepositions. Combinations placed at the upper points of the scale (i.e., idiomatic hence unanalyzable combinations, such as *hit upon* [*an idea*]) should be, too. In the former case stranding is unlikely, and in the latter pied-piping is impossible. But any combination can move along the scale, which is reflected in the contexts where extra prepositions tend to occur.

More generally, the data indicate that speakers make predictions about upcoming items that are dependent on those that have already been processed; in doing so, they follow factors and preferences inherent in language processing. Thus, what can best countenance these data are lexicalist frameworks that model as constraints any such factors influencing the behavior of constructions in actual use (e.g., Lexical Functional Grammar, CxG, or Head-Driven Phrase Structure Grammar.

Conclusion

This discussion evaluates the claims hitherto made about extra prepositions, a phenomenon whose status within the grammar ranges from ungrammatical in the Chomskyan sense to gradient. I argue that the distribution of extra prepositions in

the ME period already points to the existence of a particular type of stored *wh*-relative and *wh*-interrogative constructions. Beyond the changes in preposition placement known to accompany the transition from OE to ME, extra prepositions may have been supported by a preference to mark case on extracted *wh*-phrases by means of prepositions. This assumption is suggested by those examples where the fronted preposition signals the case assigned to the *wh*-phrase by the predicate—the prepositional verb taken as a whole. I propose that although that reference-tracking strategy ceased to be motivated by the grammar, it has continued as a performance preference to increase the accessibility of *wh*-phrases as relative markers. At the same time, the process of lexicalization has turned some verbs and prepositions into semantic units whose separation is unwelcome from the processing point of view. The results presented in the article are compatible with lexicalist theories, in particular CxG, with a close fit to noncategorical data.

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Notes

1. A model for the range of observable results might be a gradient grammar that covers categorical constraints and gradient generalizations because the existence of neither can be denied (Wasow, forthcoming).
2. Note that Staum and Sag's (2008b) results only cover identical, that is, doubled, prepositions. Here and throughout I use some of the terminology from Riley and Parker (1986), where nonidentical prepositions are called *mismatched* ones. I refer to identical prepositions as *doubled* ones; whenever both kinds are taken as a single phenomenon, I use the term *extra prepositions*.
3. This statement requires a cautionary note. There are records of prepositions that pied-pipe with *that* in relative clauses in Middle English (ME; Bergh & Seppanen 2000). Although I am not aware of any records of extra prepositions, this may need empirical verification.

4. There arguably is a trace of the accusative in (30) in that *do in* "put/place in" (cf. Middle English Dictionary [MED]) expresses motion, a strong predictor of the accusative.
5. A case-marking function of a preposition necessitates that it precede its object. The introduction of preposition stranding conceivably made the analytic dative and genitive available to relative clauses containing prepositional verbs. Without the option of stranding, relative markers would have had strings of prepositions stacked in front of them. It could be that the forces behind the spread of preposition stranding correlated with the shift toward analyticity and thus included ease of reference tracking.
6. I leave open the issue of whether ME mismatched prepositions may be due to such performance factors as speakers forgetting which preposition they fronted by the time they reach the verb. This could be the case whenever a verb allows alternatives. The distances between the prepositions do not quite support this explanation, though.
7. There is another way to ensure ease of processing in relative clauses. Replacing *which* with *where/when* guides how an extracted relative marker is to be interpreted as soon as it is encountered. It would be interesting to see whether speakers or corpora show any preferences in this respect. In the ME data, eighteen examples are replaceable by *where*, one by *when*.

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Bio

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