On Preposition Copying and Preposition Pruning in wh-clauses in English

Andrew Radford
University of Essex
radford@essex.ac.uk

Claudia Felser
University of Essex
felsec@essex.ac.uk

Essex Research Reports in Linguistics present ongoing research activities of the members of the Department of Language and Linguistics.

The main purpose of these reports is to provide a quick publication outlet. They have 'pre-publication status', and most will subsequently appear in revised form as research articles in professional journals or in edited books.

Copyright remains with the author(s) of the reports. Comments are welcome: please communicate directly with the authors.

If you have technical problems downloading a paper, or for further information about these reports, please contact the editor:

Doug Arnold: `doug@essex.ac.uk`.

On Preposition Copying and Preposition Pruning

in wh-clauses in English[1]

Andrew Radford & Claudia Felser

University of Essex

Abstract

This paper reports on *preposition copying* and *preposition pruning* in what Milroy and Milroy (1993) term 'Real English', using data from unscripted live radio and TV broadcasts. We begin by discussing the nature of the two phenomena and showing that they cannot be given a straightforward characterisation in syntactic terms. We go on to propose a processing account, under which preposition copying and pruning errors have a common source, and may either involve the sloppy carrying forward of clause-initial material during the formation of filler-gap dependencies in language production, or result from the competition of two alternative structural representations during sentence planning.

1. Introduction

Radford (2010a, 2010b) reports on a range of structures occurring in a naturalistic corpus which he collected from digital recordings of around 300 hours of broadcast output from British radio and TV stations. The data (henceforth referred to as 'our corpus') were taken from live broadcasts (mainly from sports forums, sports commentaries and sports phone-ins) in order to avoid possible prescriptive influences from copy editors. The corpus contained instances of **preposition copying** in wh-clauses like that bracketed in (1) below, in which one (bold-printed) occurrence of the highlighted preposition appears at the beginning of the (bracketed) wh-clause, and another (italicised) occurrence appears at the end:

(1)   Spurs have got four strikers [**from which** to choose *from*] (Mark Lawrenson, BBC

 Radio 5)

At the same time, the corpus also contained instances of the converse phenomenon of **preposition pruning** in wh-clauses like that bracketed in (2) below in which a wh-constituent apparently functioning as a prepositional object occurs without the relevant

---

[1]   This paper has its origins in parts of the material presented in Radford (2010a, 2010b). A typographical convention used here is that words printed in small capitals receive contrastive stress.

preposition being overtly spelled out within the clause in question (the convention adopted here being to signal the "missing" preposition by ~~strikethrough~~):[2]

(2)   That's the situation [that Obama and, to some extent, the party find themselves ~~in~~]
        (Reporter, BBC Radio 5)

Table 1 below summarises the raw frequency of preposition copying and pruning in various types of wh-clause in our corpus.

Table 1: Raw frequency of preposition copying/pruning in different types of wh-clause

Type of wh-clause	Preposition Copying	Preposition Pruning
null-operator restrictive relative clause	0	44
wh-operator restrictive relative clause	6	5
wh-operator free relative clause	1	6
wh-operator appositive relative clause	6	10
wh-operator interrogative clause	2	2
Total	15	67

Table 1 shows that preposition pruning occurs about four times as frequently as preposition copying in our corpus overall, and that about two thirds of the total number of preposition pruning tokens are found in restrictive relative clauses that lack an overt wh-operator.

The twin questions to be addressed in this paper are (i) 'What is the source of preposition copying, and of preposition pruning, and are the two phenomena inter-related – and if so how?' and (ii) 'Why is preposition pruning much more frequent than preposition copying?' We begin by looking (in §2 and §3 below) at whether Preposition Copying and Preposition Pruning can be characterised in syntactic terms, before presenting an alternative processing account of the two phenomena in §4, and presenting our overall conclusions in §5. Unless otherwise specified, all illustrative examples presented here come from our corpus.

---

[2]   Miller (1993: 112) reports that 'Prepositions are frequently omitted' when prepositional objects are relativised in Scottish English, but offers no specific analysis. As the data reported here indicate, preposition pruning is not a variety-specific phenomenon, but is widespread.

2. A syntactic account of Preposition Copying

The phenomenon of Preposition Copying can be illustrated by the following examples from our corpus:

(3) (a) He sent it straight back [**from where** it came *from*] (Michael Vaughan, Channel 5 TV)

(b) Israeli soldiers fired an anti-tank missile and hit a police post [**in which** the Palestinian policeman who was killed had been *in*] (News reporter, BBC Radio 5)

(c) Tiger Woods, [**about whom** this Masters seems to be all *about*], is due to tee off shortly (Golf commentator, BBC Radio 5)

(d) They're all striving for the health of the European Tour, **of which** they're all members *of* (Colin Montogomerie, BBC Radio 5)

(e) It's quite clear [**on which side of the Blair-Brown divide** that Alistair Campbell comes down *on*] (Political correspondent, BBC Radio 5)

The phenomenon is also found in the written language (and in popular songs), as the following examples from Radford (2004: 192) illustrate:

(4) (a) But if this ever-changing world [**in which** we live *in*] makes you give in and cry, say 'Live and let die' (Sir Paul McCartney, theme song of the film *Live and Let Die*)

(b) [**To which of these groups** do you consider that you belong *to*]? (Official form issued by local council in Clacton-on-Sea, Essex)

(c) The hearing mechanism is a peripheral, passive system [**over which** we have no control *over*] (undergraduate exam paper)

And indeed it is attested in Shakespeare's writings; cf. (5):

(5) (a) [**In what enormity** is Marcius poor *in*]? (Menenius, *Coriolanus*, II.i)

(b) [**To what form but that he is** should wit larded with malice and malice forced with wit turn him *to*]? (Thersites, *Troilus and Cressida*, Vi)

(c) …that fair [**for which** love groan'd *for*] (Prologue to Act II, *Romeo and Juliet*)

What each of the structures in (3)-(5) above shares in common is that the bracketed wh-clause begins with a prepositional phrase containing a preposition pied-piped along with a fronted wh-constituent, and ends with second occurrence of the relevant preposition. How can this dual spellout of the preposition be accounted for?

Intuitively, the phenomenon of preposition copying seems different in kind from the type of copying found in (6a,b) below, and more akin to that in (6c,d):

(6) (a) I can't see **why** (and I've looked at this for years) *why* Lampard and Gerard can't play together (Alan Brazil, Talk Sport Radio)

(b) It's just the fact of getting into space **where** … *where* his runs are clever (Robbie Savage, BBC Radio 5)

(c) It's a world record **which** many of us thought *which* wasn't on the books at all (Steve Cram, BBC2 TV, Radford 2009: 191)

(d) It's England, not Pakistan, **who** I think *who* are looking a bit frazzled (Vic Marks, BBC Radio 5 Sports Extra)

Sentences like (6a) seem to involve repetition of a single item (= *why*) in the same (clause-initial) position after the addition of a parenthetical comment: repetition here appears to serve a recapitulation function. Sentences like (6b) also seem to involve repetition, though this time serving the function of buying an inexperienced pundit (in his first appearance as co-host of a live radio phone-in) time to collect his thoughts. By contrast, (6c,d) are different insofar as the two instances of the highlighted wh-word occupy different positions at the front of two different clauses: they seem to be spellouts of two different copies of the wh-word (the first at the beginning of the embedded clause, and the second at the beginning of the matrix clause) that arise in the course of movement of the wh-word from its underlying to its superficial position (see e.g. Felser 2004). In much the same way, the two different instances of the preposition *from* in (1) could be argued to be copies which arise via movement of the prepositional phrase *from which* out of its original position at the end of the clause to its final position at the beginning of the clause.

Radford (2009: 236) attempts to capture this intuition through a spellout-based analysis of preposition fronting, preposition stranding and preposition copying in sentences such as the following:

(7) (a) The world [**in which** we are living] is changing

(b) The world [**which** we are living *in*] is changing

(c) The world [**in which** we are living *in*] is changing

Given that (as Abels 2003 has shown) preposition pied-piping is the norm cross-linguistically (preposition stranding being a relatively rare phenomenon in typological terms), Radford hypothesizes that 'Preposition pied-piping is obligatory in English (and universally)' but that languages (and language varieties) may differ with regards to which links of a movement chain the preposition is spelled out on. Reasoning along these lines, we might suppose that English has the following two alternative ways of spelling out pied-piped prepositions:

(8) (i) The preposition is given an overt spellout on the highest link of a chain (*high spellout*)

(ii) The preposition is given an overt spellout on the lowest link of a chain (*low spellout*)

It will then follow that obligatory preposition pied-piping in the bracketed clauses in (7) will yield the structure shown in simplified form below (if relative clauses involve wh-movement to spec-CP, and if movement involves copying – as in Chomsky 1981, 1995):[3]

(9) [$_{CP}$ in which [$_C$ ø] we are living *in which*]

Preposition fronting structures like (7a) result when spellout rule (8i) is applied to the structure in (9), preposition stranding structures like (7b) when rule (8ii) is applied, and preposition copying structures like (7c) when both rules are applied. Under this analysis, preposition copying in effect involves a *blend* (in the sense of Bolinger 1961) or *amalgam* (in the sense of Zwicky 2002) of preposition pied-piping and preposition stranding.

The *spellout* account outlined above makes interesting predictions about preposition stranding in long-distance movement structures like (4b) above. If wh-movement applies in a successive-cyclic fashion (as suggested by sentences like 6c,d), the wh-PP *to which of these*

---

[3] A technical complication set aside here (to simplify exposition) is whether the fronted wh-constituent moves to the edge of the verb phrase before moving to the edge of CP, as in Chomsky (1986) and much subsequent work.

groups will move to the front of the *that*-clause before moving to the front of the *do*-clause, so forming the wh-chain highlighted in (10) below:

(10)   [$_{CP}$ **To which of these groups** [$_C$ do] you consider [$_{CP}$ <u>to which of these groups</u> [$_C$ that] you belong *to which of these groups*]]

The spellout account predicts that the preposition can only be overtly spelled out on the highest link of the chain as in (11a) below, or on the lowest as in (11b) or on both as in (11c), but not on the intermediate link as in (11d):[4]

(11)   (a)   **To which of these groups** do you consider that you belong?

     (b)   **Which of these groups** do you consider that you belong *to*?

     (c)   **To which of these groups** do you consider that you below *to*?   (= 4b)

     (d)   *__Which of these groups__ do you consider *to* that you belong?

And, as far as we are aware, structures like (11d) are unattested in English.

Furthermore, the spellout analysis outlined above also accounts for why Null Operator relatives like (12a) below (i.e. relative clauses which involve fronting a null relative operator/*Op*) have no preposition copying counterpart like (12b) – as we see from the score of zero in the topmost cell in the lefthand column in Table 1:

(12)   (a)   The world [*Op* we are living *in*] is changing

     (b)   *The world [**in** *Op* we are living *in*] is changing

If preposition copying involves spelling out a fronted preposition in both its initial and final positions, we can attribute the ungrammaticality of (12a) to the constraint noted by Chomsky (1982) that a null constituent cannot pied-pipe overt material along with it under movement. This constraint will also account for the ungrammaticality of a structure such as:

---

[4]   It should be noted that (under the proposal made in Pesetsky 1987), the fronted *which*-phrase (by virtue of being D-linked – i.e. linked to some familiar element in the domain of discourse) could move directly from its initial to its final position without transiting through spec-CP in the embedded clause. However, the same theoretical point could be made in relation to a non-D-linked wh-chain, such as that in *What do you think he was talking about?* For evidence that wh-movement is successive-cyclic, see Radford (2009: 207-215) and the references cited there.

(13)   *The world [**in** *Op* we are living] is changing

Both (13) and (12b) are ruled out by the pied-piping constraint because they involve a fronted null operator illicitly pied-piping an overt preposition along with it.

It might be objected on typological grounds that the spellout analysis is implausible since there are no structures in other languages which allow prepositions to be spelled out on both the highest and lowest links of a movement chain. However, Berber has structures like that below in which a (highlighted) preposition can seemingly be spelled out on both the head and foot of a wh-chain:

(14) ***I***   ***mit***   ad   *mi*   yfa   hassan   tabrat?   (Berber, Alami in prep.)

     To   who   that   to   gave   Hassan   letter

     'To whom did Hassan give the letter?'

Berber sentences like (14) can be argued to involve wh-fronting of the bold-printed PP i_{to} mit_{whom}, but with a second (italicised) copy of the preposition i_{to} (in the guise of its augmented form mi_{to}) being stranded in situ in the syntax and then (according to Ouhalla 2005) encliticising to the complementiser ad_{that} at PF. Structures like those in (14) could be argued to add cross-linguistic plausibility to the dual spellout analysis in (8).[5]

However, there are aspects of the spellout analysis of preposition copying in English and Berber outlined above which are questionable.[6] For one thing, it should be noted that the precise analysis of Berber structures like (14) is anything but clear: an alternative possibility

---

[5]   Preposition copying is also sometimes found in Germanic languages or dialects, as in the following example from North Saxon (cited by Fleischer 2002: 143f.).

   (i)   *van Vöörgeschichten*   kann   ik   wal   wat   *van*   vertellen
       of   past   histories   can   I   well   something   of   tell
       'I can very well tell something about past histories'   (Niedersächsisches Wörterbuch IV:40)

   Glaser and Frey (2007) report P-copying in Swiss German varieties as well.

[6]   Pullum (2007) reports that an internet search revealed P-copying structures such as:

   (i)   A bit-part role is something *to which* Traore grew accustomed *to* during his time at Liverpool…

   He maintains that a P-copying structure like (i) cannot result from movement of a copy of PP, since this would be expected to result in *to which Traore grew accustomed to which…* However, if we suppose that a copy of a wh-operator can only be spelled out in an operator position (viz. Spec-CP), his objection is without force, and his self-congratulatory "**Nyaaah nyaaah**" **remark is misplaced.** Spelling out a copy of *which* after *to* in (i) would yield an illicit wh-chain with two operators and no variable.

is that (14) is a cleft sentence structure involving multiple wh-clauses, paraphraseable loosely as 'To whom is it to whom Hassan gave the letter?' (and it should be noted in this respect that the stranded preposition *mi* has an augmented spellout which could be argued to contain the same wh-morpheme *m-* as is found in wh-words like *mit*_{who}).

Furthermore, the assumption in relation to English that prepositions undergo 'invisible' pied-piping even when they seemingly remain in situ and are stranded proves problematic – as can be illustrated by contrasts such as the following:

(15) (a) **Without** *any food or water*, people cannot survive for more than a few days

  (b) **Any food or water*, people cannot survive **without** for more than a few days

  (c) *Food and water*, people cannot survive **without** for more than a few days

As we see in (15a), an (inherently negative) fronted preposition like *without* can license a polarity item (such as existential *any*) which it locally c-commands. However, if preposition stranding structures like (15b) involved preposition pied-piping (with the fronted P being given a null spellout), (15b) would wrongly be predicted to be as well-formed as (15a) or (15c). Thus, the ungrammaticality of sentences such as (15b) calls into question the suggestion that preposition-stranding structures involve covert preposition pied-piping.

Furthermore, the assumption that prepositions undergo obligatory pied-piping when their objects are moved faces obvious problems in relation to sentences such as the following (where *what…for* has the sense of 'why'):

(16) (a) **What** did you do that *for*?/**For* **what** did you do that?

  (b) **Where** are you going *to*?/**To* **where** are you going?

  (c) **Where** are we *at*, right now?/**At* **where** are we right now?

It is not obvious how to account for structures like (16) in which the (italicized) preposition *for/to/at* obligatorily remains in situ when its bold-printed complement is fronted if we suppose that prepositions are obligatorily pied-piped when their complements are moved.

Such considerations suggest that the analysis in Radford (2009) needs to be refined if it is to be salvaged. One way of revising it would be to suppose that prepositions only undergo pied-piping if some overt copy of the preposition appears at the head of the movement chain, and not if the only overt copy of the preposition is in situ/stranded, and to suppose that the highest copy of a moved constituent is always overtly spelled out in English. On this view,

wh-movement would give rise either to preposition-pied-piping structures such as (17a) below, or to preposition-in-situ structures such as (17b):

(17) (a)   [CP **in which** [C ø] we are living *in which*]   (= 9)

      (b)   [CP **which** [C ø] we are living in *which*]

In (17a), if the (obligatory) *high spellout* rule (8i) applies on its own, the result will be to derive the preposition fronting structure (7a); if the (optional) *low spellout* rule (8ii) also applies, the result will be to derive the preposition copying structure (7c). In the case of (17b), there is no movement of the preposition, with the result that application of either spellout rule in (8) will result in the sole (in situ) copy of the preposition being overtly spelled out.

However, both the original and the revised version of the high/low spellout analysis outlined in this section face further objections. For one thing, the two spellout rules in (8) operate in different styles of English (high spellout being characteristic of high styles, and low spellout of low styles), so it is questionable whether speakers would mix styles and use both spellout rules. Moreover, the spellout rules in (8) are disjunctive alternatives, so a conjunctive analysis which supposes that preposition copying comes about by applying both rules is of questionable plausibility. In addition, it might be maintained that the very low frequency of preposition copying (see Table 1) suggests that preposition copying is more likely to be a sporadic processing error than a productive spellout phenomenon (an idea to be further developed in section 4).

Having attempted to arrive at a principled structural characterisation of Preposition Copying, in the next section we attempt to develop a structural account of Preposition Pruning.

3. A structural account of Preposition Pruning

The phenomenon of Preposition Pruning can be illustrated by the following examples taken from our corpus.

(18) (a)   I do think that **in** the society [we live ~~in~~ at the moment], it's important to maintain good relations between Church and State (Vatican spokesman, BBC Radio 5)

      (b)   He SHOULD do really, **in** the predicament [he finds his team ~~in~~] (Jonathan Agnew, BBC Radio 5 Sports Extra)

(c) It won't just be me banging on **about** things [I know nothing ~~about~~] (Tony Livesey, BBC Radio 5)

(d) **With** everything [the government has to deal ~~with~~ at the moment], what should be its main priority? (Interviewer, BBC Radio 5)

An interesting observation about preposition pruning in the examples above is that all instances involve relative (rather than interrogative or exclamative) clauses, and all are structures in which the antecedent of the bracketed relative clause is the object of a bold-printed preposition which is identical to the 'missing' preposition in the relative clause. Why should this be?

One possible structural answer (which capitalizes on the observation that all the examples in (18) are wh-less relatives and exploits the idea that such relatives are derived by antecedent raising, as argued in Vergnaud 1974, Aoun & Li 1993, Kayne 1994, and Bianchi 1995, 1999, 2000) would be to suppose that apparent preposition pruning arises via raising of the relativised PP out of the relative clause into the specifier position within a superordinate projection where it becomes the antecedent of the relative clause – as illustrated in simplified schematic form in relation to the bracketed relative clause in (18a) by the arrowed movement shown in (19) below:

(19)   [**in the society** [we live *in the society* at the moment]]

If we suppose that all constituents of the PP are spelled out on the highest copy of the movement chain, it then follows that we should only expect to find a single copy of the preposition in such structures. Since antecedent raising is only found in relatives[7], such an analysis predicts that preposition pruning will only take place in relatives, not in interrogatives or exclamatives.

However, a potential complication for the antecedent raising account is that an alternative realisation of such relatives is for a copy of the preposition to appear inside the relative clause – as in structures such as those below (which are commonplace):

---

[7]   Fronting of a whole (italicised) PP could be argued to be independently motivated by free relatives like:

(i)   I will go *to whatever place* you go

(20) (a) **In** the position [that he was *in*], why did he have to fly in like that? (John Motson, BBC Radio 5)

(b) He was trying to be much too clever **against** the opponents [he's been up *against*] (Connor MacNamara, BBC Radio 5)

(c) Passengers will be flown back, normally **to** the airport [that they have been booked *to*] (Travel operator, BBC Radio 5)

(d) We are really talking **about** something [we don't know the facts *about*] (Alan Green, BBC Radio 5)

Nevertheless, such examples can be accommodated within the relative raising analysis if we suppose that they involve raising only the object of the preposition, so that the relevant part of (20a) would involve the arrowed movement operation shown in simplified schematic form below:[8]

(21) [in [**the position** [he was in *the position*]]]

On this view, whether or not the relevant preposition appears in the relative clause depends on whether the preposition is pied-piped along with the expression it governs under relative raising (i.e. raising of the relativised constituent)[9].

However, the relative raising analysis will not handle preposition pruning in structures such as that below:

---

[8] A variant of the relative raising analysis (which we will not discuss here) would be to suppose that only the noun *position* is raised.

[9] Our corpus also contains the two examples below, the first of which shows overt spellout of the preposition inside the relative clause with concomitant pruning of the preposition governing the antecedent of the relative clause, and the second of which shows pruning of both prepositions:

(i) If anyone could hit a ball like that, it's Cristiano Ronaldo, ~~in~~ *the form that he's been in* (Kevin Keatings, Sky Sports TV)

(ii) ~~In~~ *the kind of goal-scoring form that he has been* ~~in~~, that was a good chance (Alan Smith, Sky Sports TV)

Note that if we replace the italicised adjunct by the phrase *in his current form*, it would not be possible to prune *in*.

(22) (a) Everything [I've spoken ~~about~~ today] talks **about** not coming out of the recession at all (Economics reporter, BBC Radio 5)

(b) The club's demise has put Fergie **in** a very awkward position – one [**that** he doesn't feel comfortable ~~in~~] (John Scales, BBC Radio 5)

The reason is that the (bold-printed) occurrence of the preposition in the matrix clause does not govern the antecedent of the relative clause. Moreover, the theoretical and empirical basis of the antecedent raising analysis has been questioned by numerous linguists (including Pollard & Sag 1994, and Borsley 1997, 2001).

An alternative structural analysis (framed within a wh-movement analysis of relative clauses) which will handle preposition pruning in all three types of structure in (18), (20) and (22) is the following. Let us suppose that relative clauses involve wh-movement of an (overt or null) relative operator to the edge of the clause, and that material internally within a relative clause can optionally be given a null spellout if there is some identical material within the matrix clause which makes its content recoverable (in accordance with the 'recoverability principle for deletion' posited by Chomsky 1977: 446). This would mean that the relevant part of (21a) would have the structure shown in simplified form below:

(23) [$_{PP}$ in [$_{DP}$ the society [$_{CP}$ **which** we live *in*]]]

The (bold-printed) wh-pronoun could be given a null spellout (or be substituted by a null operator) because its content is recoverable from its antecedent *the society*, while the (italicized) preposition could be given a null spellout because it is identical to the bold-printed occurrence of the same preposition *in* found in the matrix clause – and such an analysis could potentially be extended to sentences like (22).

Both structural analyses outlined above predict that preposition pruning requires *identity* between an occurrence of a preposition in the relative clause and another in the matrix clause. However, examples such as those below suggest that preposition pruning also occurs in structures where this *identity condition* is not met:

(24) (a) This is a race [you never know what's going to happen ~~in~~] (Anthony Davidson, BBC Radio 5)

(b) One of the things [we want to make sure ~~of~~] is that people do change their behaviour (Government spokesman, BBC Radio 5)

(c)   The one [he got Strauss out ~~with~~] was excellent (Geoff Boycott, BBC Radio 5 Sports Extra)

(d)   It's a fun exercise, rather than something [that Messrs Miller and Flower will have any input ~~into~~] (Jonathan Agnew, BBC Radio 5 Sports Extra)

(e)   This is a matter [for people to make their minds up ~~about~~] (Dave Watts, BBC Radio 5)

In each of the above structures, the preposition missing from inside the bracketed relative clause (this being an infinitival relative in 24e) has no counterpart in the matrix clause, so there is no question of deletion under identity. How, then, can structures like (24) be accounted for?

One way in which we might seek to account for such structures would be to exploit the possibility that the bracketed restrictive relative clauses in sentences such as those below involve a null relative operator (as argued by Rizzi 1990: 68, Haegeman 1994:464, and Radford 1997: 306):

(25)   (a)   San Francisco is a great place [to live]

(b)   The way [he behaved] was appalling

(c)   Do you remember the time [we first met]?

(d)   The reason [I was late] is that my car broke down

The null operator has a restricted set of functions, and has a LOCATIVE interpretation in sentences like (25a), a MANNER interpretation in (25b), a TEMPORAL interpretation in (25c), and a CAUSAL interpretation in (25d). If we were to extend the null operator analysis to sentences like those in (24) above, the relative clause in (24a) would have the structure bracketed in (26) below:

(26)   This is a race [$_{CP}$ *Op* [$_{C}$ ø] you never know what's going to happen]

The null operator in (26) would then have the same LOCATIVE interpretation as in (25a), so that the null operator would be paraphraseable as 'where'.

However, in order to extend the null operator analysis to the full range of sentences in (24), we'd need to say that the relevant speakers allow the operator to have a much wider range of oblique interpretations than is found in sentences like (25) – e.g. an INSTRUMENTAL

interpretation in (24c), a TOPICAL interpretation in (24d), and a GOAL interpretation in (24e). This might lead us to hypothesise that a null operator in spoken English can in principle take on any thematic role, provided that its role identifiable in some way (e.g. from the selectional properties of the associated predicate). On this view, the bracketed relative clause in (24e) would have the structure shown in simplified form below:

(27)   The one [*Op* he got Strauss out] was excellent

Given that *get out* is a predicate which (in the relevant cricketing use) takes an instrumental argument (cf. *He got him out with a bouncer*), the operator in (27) would receive an instrumental interpretation. Let's say that people who allow the null operator to have a much wider range of roles than those it has in sentences like (25) allow it to be used in a *sloppy* fashion.

Some plausibility is lent to the suggestion that the null operator can be used in a sloppy fashion in spoken English by the observation that overt oblique wh-operators like *where* in sentences like (28) below and *whereby* in sentences like (20) are likewise used in a sloppy fashion in spoken English:

(28)   (a)   He's obviously gone for the side **where** he thinks he'll get the result on the night (Mark Bowen, BBC Radio 5)

(b)   I think it's time **where** somebody SHOULD (Mark Lawrenson, BBC Radio 5)

(c)   I think it's about helping young people in a way **where** they don't feel judged (Social worker, BBC Radio 5)

(d)   We're worried about teams **where** you think "How many of these teams would get into the Premier League?" (Chris Waddle, R5)

(29)   (a)   England put themselves in a position **whereby** that they took a lot of credit for tonight's game (Ron Greenwood, BBC Radio 4; from Radford 1988: 486)

(b)   You've still got a game **whereby** things can turn round (Graham Taylor, BBC Radio 5)

(c)   Does he love Liverpool to the extent **whereby** Pepe Reina would leave Liverpool? (Mark Chapman, BBC Radio 5)

(d)   He was brought up in a hard area in a hard city, **whereby** he's used to dealing with hardship (Mark Fullbrook, BBC Radio 5)

For example, instead of its canonical LOCATIVE role, *where* plays an INSTRUMENTAL role in (28a), a TEMPORAL role in (28b), a MANNER role in (28c), and a RELATIONAL role ('in relation to which') in (28d). Likewise, instead of its canonical INSTRUMENTAL role, *whereby* takes on a LOCATIVE role in (29a,b), an EXTENT role in (29c), and a RESULTATIVE ('as a result of which') role in (29d). The fact that overt operators are sometimes used in a sloppy fashion in spoken English makes it all the more plausible to suggest that null operators can similarly be used in a sloppy fashion.

However, while the sloppy null operator analysis can be argued to handle wh-less restrictive relatives like those in (24), it can't be extended to preposition pruning in clauses containing a (bold-printed) overt wh-operator such as wh-restrictives like that bracketed in (30a) below, appositive relatives like that in (30b), free relatives like that in (30c), or interrogatives like that in (30d):

(30) (a) Laura Maxwell is with someone [**who** I think, Laura, that's happened ~~to~~]
(Aasmah Mir, BBC Radio 5)

(b) When I went over there, they were clowning around, [**which** I didn't really care ~~about~~] until I found out they had lost my file (unidentified American informant, Kuha 1994)

(c) [**What** we're making sure ~~of~~] is that the information that comes in to policy makers is a little more balanced (Ken Clarke, BBC Radio 5)

(d) [**What sort of shape** is he ~~in~~], going into Wimbledon, then? (Mark Pougatch, BBC Radio 5)

The reason is that null operators are only found in clauses which do not contain an overt wh-operator, hence not in restrictive relative wh-clauses, nor in appositive relatives, free relatives or interrogatives (all of which contain an overt wh-operator).

One might conceivably seek to extent the sloppy operator analysis by supposing that not just null wh-operators but also overt wh-pronominals (like *who* in 30a, *which* in 30b and *what* in 30c) and overt wh-nominals (like *what sort of shape* in 30d) can be used in a sloppy fashion to fulfil a thematic role which is identifiable from the context. We could then say (e.g.) that there is no stranded preposition in (30a), but rather that *who* in is a bare pronoun which originates as the complement of the verb *happen*, so that the Verb Phrase headed by *happen* has the initial structure below*:*

(31) [$_{VP}$ that [$_V$ happen] who]

The thematic role of *who* would then be determined by the selectional properties of the verb *happen* – e.g. *happen* selects an EXPERIENCER argument and so *who* is interpreted as the EXPERIENCER argument of *happen*. Subsequent application of other Merger and Movement operations (including fronting of *who* by WH-MOVEMENT) eventually results in the bracketed relative clause in (30a) having the structure shown in skeletal form below:

(32) [$_{CP}$ who [$_C$ ø] I think, Laura, that's [$_{VP}$ ~~that~~ happened ~~who~~]]

On this view, the sloppy use of an overt wh-operator would involve sloppy spellout of the relevant thematic role – i.e. a failure to spell out the EXPERIENCER complement of *happen* by use of the preposition *to*.[10]

    However, what the 'sloppy spellout' analysis outlined above fails to account for is why the preposition which is normally used to spell out a particular thematic role with a particular predicate is only omitted when the relevant constituent undergoes wh-movement, and not when it remains in situ. In other words, the analysis fails to account for why our corpus contains no instances of structures such as the following, in which a preposition introducing an in situ complement is omitted:

(33) That once happened *(*to*) *me* in a supermarket

This leads to the more general conclusion that the sloppy operator/sloppy spellout analyses explored here fail to account for why preposition pruning is only found in wh-chains. Accordingly, in the next section, we turn to explore the possibility of developing a more general account of preposition pruning (and preposition copying) in processing terms.

4. An alternative processing account

Since preposition copying and preposition pruning are relatively sporadic phenomena which (as we have seen in the two previous sections) cannot be given a straightforward and

---

[10] A variant of the analysis in (31) would be to suppose that the wh-constituent in sentences like those in (30) is the complement of a null preposition which is contextually identified (e.g. via the selectional properties of the relevant predicate).

principled characterisation from the perspective of a right-to-left, bottom-up approach to structure-building and spellout, an alternative hypothesis worth exploring is that these phenomena arise for processing reasons.

Most current models of language production assume that producing an utterance involves different levels of processing which operate largely in parallel, and distinguish the process of generating a structural frame for the intended utterance from the process of inserting lexical items into syntactic slots with their phonological form specified (e.g. Garrett 1984). In addition, some form of perception-based self-monitoring is thought to accompany normal language production, allowing us to detect errors and triggering self-repair (Levelt 1989). While there is evidence that phrases may be the default grammatical planning units for spontaneous speech (Martin et al. 2010, Smith & Wheeldon 1999, among others), the extent to which we plan the form of an utterance ahead also seems to be affected by processing pressure or 'cognitive load' (Martin et al. 2010, Wagner et al. 2010). Results from other studies indicate that sentence production may be highly incremental (Ferreira & Swets 2002, Griffin 2001, Meyer et al. 1998), that is, planning and speaking may sometimes happen concurrently. Note that most of the utterances in our corpus were produced in situations of high processing pressure, with limited opportunity for speakers to plan either the form or the content of their utterances very far ahead. This makes unscripted live radio and TV broadcasts a potentially very rich source of performance errors.

Recall that the production data under scrutiny here all seem to involve the incorrect spellout (i.e. either copying or omission) of some element at the foot of a wh-chain. One hypothesis to be considered, then, is that rather than representing downright grammatical errors, preposition copying and preposition pruning merely reflect the erroneous insertion of phonological forms into, or their omission from, otherwise well-formed syntactic frames during sentence production. We develop possible analyses along these lines in §4.1 and §4.2 below, and then tie up some loose ends in §4.3.

4.1 Preposition copying

Let us first consider preposition copying in examples such as (1), repeated here for convenience.

(1)   Spurs have got four strikers [**from which** to choose *from*]

From a left-to-right processing perspective, a fronted constituent (or 'filler') such as *from which* in (1) needs to be kept in working memory until its base position (or associated 'gap') has been identified, at which point the moved element will need to be retrieved from memory and linked to its subcategoriser or other lexical licenser for thematic or semantic role assignment, to allow for it to be fully integrated into the emerging sentence representation. Although the majority of studies investigating the processing of movement dependencies are based on data from sentence comprehension tasks, there is evidence that movement 'traces' also form part of the grammatical representations generated during sentence production (Franck, Lassi et al. 2006, Franck, Soare et al. 2010). Results from processing studies have shown that both the carrying forward of a fronted constituent during real-time processing and its integration at the foot of the chain incur a computational cost, which rises as a function of distance (Gibson 1998) and of the cognitive load associated with processing the intervening material (Warren & Gibson 2002). Evidence from the processing of VP ellipsis moreover suggests that when coming across a structural gap whose contents need to be recovered to ensure full interpretation, we may also recover details of the antecedent's internal syntactic structure (Shapiro et al. 2003).

With regard to seemingly ungrammatical examples such as (1), we might assume that the speaker, when generating a syntactic frame for the verb phrase headed by the PP's lexical licenser (viz. the verb *choose*), also constructed a postverbal PP as part of this frame. However, rather than reconstructing the fronted material silently, he erroneously copied the preposition's phonological features as well, resulting in a redundant second spellout of the preposition at the foot of the chain, as shown in (34).

(34)   Spurs have got four strikers [$_{CP}$ [$_{PP}$ [$_P$ **from**] [$_D$ **which**]] to choose [$_{PP}$ [$_P$ **from**] [$_D$ __]]]

Two questions immediately arise at this point, however: (i) Exactly what processing factors or mechanisms could give rise to copying errors of this kind, and (ii) why is only the preposition copied, rather than the entire PP or the wh-word on its own? As to the first question, one possibility is that preposition copying results from processing resource limitations that prevent speakers from carrying forward a fully specified representation of the fronted PP. Due to the relatively high processing pressure live TV or radio broadcasters typically find themselves under, they may occasionally forget exactly what form a fronted constituent had taken (i.e. was it 'from which' or 'which'?), and in spelling out the preposition again postverbally simply err on the side of caution. Put differently, a speaker

who begins a wh-clause using the pied-piping option may sometimes remember or 'carry forward' the wh-complement of the preposition only, as indicated in (35).

(35)   ...four strikers [CP [PP [P **from**] [D **which**]] to choose [PP [P **from**] [D ~~which~~]]]

An account of preposition copying in terms of processing resource limitations would seem to be in line with the results from a reading-time experiment reported by Staum and Sag (2008) which show that the relative difficulty of processing preposition copying structures is affected by the amount of material intervening between the two copies of the preposition. Readers were found to be slowed down by a doubled preposition only if both copies were relatively close together but not if they appeared further apart.

Why should only the preposition be copied, though? Note that in copying just the preposition, speakers observe grammatical well-formedness constraints insofar as they produce verb phrases which are *locally* grammatical (as preposition stranding is an available option in English after all), and copying the preposition does not seem to affect semantic interpretation or render a sentence uninterpretable. Copying either the full PP or the wh-pronoun on its own, on the other hand, would result in syntactic ill-formedness and potential uninterpretability, due to the wh-operator feature carried by *which* being expressed both in an operator and in an argument position, in violation of the WH-CRITERION (Rizzi 1990).

Evidence that speakers may not only forget whether or not a preposition was spelled out initially but may also sometimes forget exactly which preposition was spelled out is provided by the bracketed structures in the sentences below (36d being from a written source):

(36)   (a)   Every sport needs some power house [**with which** other teams can measure their success *by*] (Russell Fuller, BBC Radio 5)

(b)   The journalist I was talking **to** *with* pointed this out (Andy Brassell, BBC Radio 5)

(c)   The question is [whether **or not** it did him any good *or not*] (Jonathan Agnew, BBC Radio 5)

(d)   [40c] itself I find to be **of** only *of* marginal acceptability (Newmeyer 2003: 404)

(e)   Who are you looking forward **to** *to* seeing this week? (Mark Chapman, BBC Radio 5)

(f)   **For** the people **for** whom it's affected, it's been a devastating event (Newspaper editor, BBC Radio 5)

(g)   There were three conditions, **of which** I supposedly fulfilled *them all* (Surgeon, BBC Radio 5)

(h)   We'll have a right go at him in the second half, [**of which** we haven't got long to wait *for*] (Alan Green, BBC Radio 5)

(i)   Can the Prime Minister have a look at this website, [**where** a whole host of anti-police statements are *on there*]? (MP, Prime Minister's Questions, BBC Radio 5)

(j)   Man City and Spurs are the teams [that realistically he would be competing…*with*, for fourth place] (Oliver Caine, BBC Radio 5)

In (36a), the speaker not only forgets that the pied-piped preposition has already been spelled out at the head of the wh-chain, but also forgets *how* it was spelled out (resulting in a preposition mismatch – albeit either preposition would be equally appropriate in the relevant context if used on its own). In (36b) the speaker shows a similar confusion about the subcategorised preposition, first producing *to* and them seemingly correcting it as *with*. In (36c), the speaker (when coming to the end of the sentence) seemingly forgets that he has already produced the disjunctive tag *or not*, and so repeats it at the end of the sentence. In (36d), the writer seemingly sets out to produce *of only marginal acceptability*, but then forgets that he has already produced *of* and so repeats it, thereby producing a blend of the phrases *only of marginal acceptability* and *of only marginal acceptability*. In (36e) the speaker appears to set out to produce *Who are you looking forward to?* and then instead decides to produce *Who are you looking forward to seeing?* and backtracks to the start of the PP *to seeing* ~~who~~. In (36f), the speaker fronts the topicalised nominal *the people whom it's affected* and pied-pipes the preposition along with it, but spells out one (licit) copy of the preposition before the fronted nominal and another (illicit) copy before the fronted wh-pronoun *whom*: it may be that the speaker had originally planned to say *For the people for whom it's affected their lives*, but forgot to spell out the object *their lives*. In (36g), the speaker seemingly starts out to produce the pied-piping relative clause structure *of which I supposedly fulfilled all*, and misremembers this as a co-ordinate structure and so continues as

if producing *and I supposedly fulfilled them all*.[11] In (36h), the clause-final preposition *for* is selected by the verb *wait* but the clause-initial preposition *of* is not (which may mean that *of* is used as a default choice of preposition when the speaker forgets what the appropriate preposition is, perhaps by virtue of having no lexical semantic content – *of* being taken by some to be a case particle). In (36i), the (right honourable) speaker is seemingly confused over whether to relativise the locative adjunct by a prepositional structure headed by *on* or by an adverbial structure with *where*, and produced a seeming blend of the two. In (36j), there is a marked pause (of around a second in length) after the verb *competing*, which may well arise when the speaker backtracks to see whether he had previous spelled out the preposition *with* at the front of the relative clause.

Another possibility is that preposition copying in sentences like (1) results from problems with grammatical planning. Under this view, preposition copying might be characterised as a syntactic *blending* error (Cohen 1987, Stemberger 1982), with the pied-piping and corresponding preposition stranding options conflated or realised near-simultaneously in the same clause. Syntactic blends have been shown elsewhere to be facilitated by structural similarity (Cutting & Bock 1997). According to Coppock (2010: 48), they arise when "multiple formulations of the same message are developed in the same memory buffer", with the two alternative representations then interacting and competing during grammatical structure-building. Note that from a left-to-right processing perspective, a characterisation of preposition copying along these lines would not require us to assume that preposition pied-piping is obligatory in English, an assumption that was called into question earlier in the light of the ungrammaticality of examples such as (15b). Either way, on the assumption that advance grammatical planning does not normally extend beyond the phrase level (e.g. Martin et al. 2010), and given that syntactic representations decay rather quickly during language processing (compare e.g. Branigan et al. 1999), the occurrence of imperfect filler-gap mappings in spontaneous language production is not particularly surprising.[12]

---

[11] Pied-piping of the preposition *of* along with its complement (although rare in spoken English) does not seem to cause problems in itself, since we find sentences such as:

   (i) Gibson now rolls the ball to Bébé, **of whom** we were just speaking (Simon Brotherton, BBC Radio 5)

   (ii) The Ethics Committee (**of which** Seb Coe used to be the chair) will take this seriously (David Davies, BBC Radio 5)

[12] Compare also Arregui et al. (2006), who examine antecedent-gap mismatches in VP ellipsis structures.

One important thing to note is that preposition copying – regardless of whether this involves the sloppy carrying forward of a fronted wh-constituent or difficulties with advance grammatical planning – seems nevertheless constrained by both grammatical and semantic well-formedness principles in that it will not normally result in either local ungrammaticality or global uninterpretability. As preposition copying affects prosodic structure by adding another syllable, it is easy to see why poets such as Shakespeare might have used such blends deliberately (as in examples (5a-c) above) to help preserve the iambic pattern of his verses or to other poetic effect.

If the above characterisation of preposition copying is along the right lines, we would not expect to find any instances of preposition copying in contexts in which preposition stranding is ruled out, or instances in which the wh-complement of a fronted preposition is copied at the foot of the chain. We will return to these predictions below.

4.2 Preposition pruning

Next, let us consider preposition pruning in examples such as (18a) and (24a), repeated below, and examine whether the omission of prepositions in wh-contexts might also be accounted for in processing terms.

(18) (a)   I do think that in the society [we live ~~in~~ at the moment], it's important to maintain good relations between Church and State

(24) (a)   This is a race [you never know what's going to happen ~~in~~]

From a processing perspective, it is conceivable that pruning errors also result from the sloppy computation of filler-gap dependencies. The only difference between the two types of error under consideration, then, would be that in the case of preposition pruning, the speaker mistakenly thinks that a preposition or prepositional wh-phrase had been spelled out at the left clausal periphery when in fact it was not – cf. (37) below.

(37) in the society [$_{CP}$ [$_{PP}$ ~~in which~~] we live [$_{PP}$ *~~in which~~*] at the moment]

Alternatively, preposition pruning may also reflect grammatical planning problems. Due to two possible structural representations being simultaneously activated during sentence

planning, the speaker here starts out producing a null wh-operator structure but then continues the wh-clause in accordance with a pied-piping representation, thus effectively blending the two (fully grammatical) options (38a) and (38b) into (38c).

(38) (a) in the society [$_{CP}$ *Op* [$_C$ ø]] we live [$_{PP}$ [$_P$ *in*] ~~*which*~~]] at the moment]

(b) in the society [$_{CP}$ [$_{PP}$ *in which*]] we live [$_{PP}$ ~~*in which*~~]] at the moment]

(c) in the society [$_{CP}$ *Op* [$_C$ ø]] we live [$_{PP}$ ~~*in which*~~]] at the moment]

On this view, both preposition copying and pruning could be characterised as syntactic blends which result from the competition between preposition pied-piping and preposition stranding representations during grammatical encoding. While pied-piping representations gain an initial advantage over stranding representations during the generation of preposition copying structures but are subsequently overridden by the latter, preposition stranding representations gain a temporary advantage over pied-piping representations in the production of preposition pruning structures.

Preposition pied-piping appears to be much rarer in spoken compared to written language, which may explain why in our corpus we found around four times as many examples of preposition pruning (which start out as preposition stranding structures) as instances of preposition copying (which start out as pied-piping structures); compare Table 1. Gries (2002) reports not finding a single instance of preposition pied-piping in the spoken parts of the *British National Corpus*, but an about equal number of pied-piping and stranding examples in the written parts of the corpus.[13] The assumption that preposition pruning structures are syntactic blends of the type shown in (38c) may also provide us with a fairly straightforward explanation of why preposition pruning (unlike preposition copying) errors should predominantly occur in restrictive relative clauses (as shown in Table 1). In English, only restrictive relatives can be introduced by a null operator, and given our hypothesis that speakers avoid generating locally ungrammatical strings, blends of the type in (38c) should only be found in restrictive relatives. Assuming that null operator relatives are the most economical ones from the point of view of language production may account for our

---

[13] Gries (2002) also presents evidence suggesting that speakers' choice of preposition pied-piping vs. stranding may be influenced by the length or processing complexity of the material intervening between the filler and the gap, with pied-piping more likely to be used where processing cost is relatively high. However, with preposition pied-piping predominantly used in the written modality, it is unclear to what extent any such potential correlations might also apply to (unscripted) spoken language production.

observation that pruning errors by far outnumber copying errors in restrictive relatives, as producing copying errors would require the speaker to initially opt for a pied-piping structure instead. In non-restrictive contexts and other types of wh-clause, pruning errors should only occur where the wh-operator is spelled out overtly, as in the examples in (30) above, and the asymmetry between copying and pruning structures observed for restrictives should be reduced or disappear (compare Table 1).

In summary, examining preposition copying and pruning errors from a processing perspective allows for both of them to be traced back to a unique source. They may either involve the sloppy carrying forward of clause-initial material during the formation of filler-gap dependencies in language production, or result from the competition of two alternative structural representations during sentence planning. Further experimental and corpus research will be necessary to help us empirically dissociate these two possibilities.

4.3 Predictions and some loose ends

The key assumption underlying the processing account outlined above is that preposition copying and preposition pruning arise in structures in which a preposition is both preposable and strandable and where the speaker (when coming to the end of the relative clause) completes the dependency in a way that does not fully correspond to the shape of the wh-element at its head. One prediction made by this analysis is that these phenomena should not be restricted to wh-clauses, but should also be found in other structures involving movement with optional pied-piping. And indeed this is the case – as the following examples illustrate:

(39) (a) England, **the condition of their units**, they are reasonably satisfied ~~with~~ (Mike Hooper, BBC Radio 5)

(b) **On** comes *on* Begara (Rob Hawthorne, Sky Sports TV)

In (39a), the bold-printed nominal *the condition of their units* originates as the object of the preposition *with*. The speaker (it would seem) mistakenly thinks he has pied-piped the preposition *with* along with its object when the object is moved to the front of the clause under Topicalisation, and accordingly fails to spell out the in situ copy of the preposition at the end of the clause, so resulting in preposition pruning. In (39b), the speaker seemingly forgets that he fronted the preposition via LOCATIVE INVERSION and additionally spells it out in its in situ position after the verb, so resulting in preposition copying.

A second prediction made by the analysis is that neither pruning nor copying will arise in structures like (16) above in which a preposition is obligatorily stranded by virtue of being unpreposable.

A third prediction (the converse of the second) is that neither pruning nor copying will arise in structures like that below in which a preposition is unstrandable and must obligatorily be preposed:

(40) (a)   **To** *what extent* is climate change affecting animal life?

(b)   *What extent is climate change affecting animal life **to**?

These two predictions (that pruning and copying only arise with prepositions which are preposable and strandable) generally hold true in our corpus – with the sole exception of the bracketed free relative clauses in the pseudo-cleft sentences below:

(41) (a)   [**What** I do agree with him ~~about~~] is that there isn't enough depth in the squad (Brian Woolnough, BBC Radio 5)

(b)   [**What** I would agree with the caller ~~about~~], though, is that in the modern game you can get two soft yellows (Darren Fletcher, BBC Radio 5)

(c)   [**What** he went wrong ~~on~~] was to come sliding in, in these conditions (Jimmy Armfield, BBC Radio 5)

(d)   [**What** we need to make sure ~~of~~] is that we don't get too hysterical (Labour party blogger, BBC Radio 5)

(e)   [**What** we're making sure ~~of~~] is that the information that comes in to policy makers is a little more balanced (Ken Clarke, BBC Radio 5)

(f)   [**What** we want to make sure ~~of~~] is that every foreign student that comes here is a legitimate student (Government spokesman, BBC Radio 5)

The examples in (41) are pseudo-clefts involving a bracketed free relative clause in which the deleted preposition is not preposable – as we see from the ungrammaticality of (42) below:

(42) (a)   *[*About* **what** I agree with him] is that there isn't enough depth in the squad

(b)   *[*About* **what** I would agree with the caller], though, is that in the modern game you can get two soft yellows

(c)   *[*On* **what** he went wrong] was to come sliding in, in these conditions

(d)   *[*Of* **what** we need to make sure] is that we don't get too hysterical

(e)   *[*Of* **what** we're making sure] is that the information that comes in to policy makers is a little more balanced

(f)   *[*Of* **what** we want to make sure] is that every foreign student that comes here is a legitimate student

Sentences like (41) would therefore seem to pose an empirical challenge to the assumption that only prepositions which are preposable (as well as strandable) are subject to pruning.

However, it may well be that preposition pruning in sentences like (41) has a different source. For example, alongside (41a-c) above we also find (43a,b) below:

(43)   (a)   [**Where** I agree with him] is that there isn't enough depth in the squad

(b)   [**Where** I would agree with the caller], though, is that in the modern game you can get two soft yellows

(c)   [**Where** he went wrong] was to come sliding in, in these conditions

It is therefore plausible to suggest that a sentence like (41a) arises when the speaker comes to the end of the relative clause and forgets whether he introduced it by *what* or *where*, so that (in effect) the free relative *what I do agree with him* in (41a) is a blend between *what I do agree with him about* and *where I do agree with him*. Potential plausibility is lent to this claim by sentences such as (44) below (describing the reaction of the American public to the derby match between Barcelona and Real Madrid):

(44)   But this is the one match [**where** football fans (not the average sports fan, but football fans) really pay attention *to*] (Sean Wheelock, BBC Radio 5)

It would seem that the speaker in (44) produced a blend between a *where* relative and a *which…to* relative.

Preposition pruning in (41d-f) may have a different source. There are potential parallels here with (24b) above – the relevant sentences being repeated below:

(24)   (b)   One of the things [we want to make sure ~~of~~] is that people do change their behaviour (Government spokesman, BBC Radio 5)

(41) (d)   [**What** we need to make sure ~~of~~] is that we don't get too hysterical (Labour party

blogger, BBC Radio 5)

(e)   [**What** we're making sure ~~of~~] is that the information that comes in to policy

makers is a little more balanced (Ken Clarke, BBC Radio 5)

(f)   [**What** we want to make sure ~~of~~] is that every foreign student that comes here is a

legitimate student (Government spokesman, BBC Radio 5)

All four are sentences in which the clefted *that*-clause is focused. However, in terms of its thematic structure, the *that*-clause is interpreted as the thematic complement of *sure*, so that e.g. (41d) has the same thematic interpretation as 'We need to make sure that we don't get too hysterical'. The use of a preposition to introduce the complement of a predicate like *sure* is subject to a constraint illustrated below:

(45) (a)   England will win the next World Cup, I'm sure *(**of**) it

(b)   England will win the next World Cup, I'm sure (***of**)

(c)   I'm sure (***of**) that England will win the next World Cup

When *sure* has a (pro)nominal object like *it* in (45a), the preposition *of* is used obligatorily (arguably, in order to ensure that the complement is case-marked). However, when *sure* has a clause as its object (as in 45b,c), the preposition is obligatorily omitted (arguably because clauses are caseless, as argued by Stowell 1981 and Safir 1986). This raises the possibility that omission of the preposition *of* in (24b, 41d-f) comes about because the speaker assumes that *of* is not required in a structure in which the thematic complement of *sure* is a clause.[14] Examples like (46) below show a preposition being pruned when its complement is a clause:

(46) (a)   What sort of factors will you consider when looking ~~at~~ who to support? (Rachel

Burden, BBC Radio 5)

(b)   Let's not talk ~~about~~ how bad Arsenal were, let's talk ~~about~~ how good West Brom

were (Robbie Savage, BBC Radio 5)

(c)   I have got a few doubts in my mind ~~about~~ what we can do against a talented

Bulgaria (Mark Bowen, BBC Radio 5)

---

[14]   A minor descriptive detail set aside here is that wh-clauses allow optional use of a preposition (e.g. *I'm not sure (about) why he went there*), and gerunds require obligatory use (e.g. *You can't be sure of finding a solution*).

(d)   Regardless ~~of~~ whether they've been successful over the past three or four years, I'm looking forward to working with them (Brian McDermott, BBC Radio 5)

If so, sentences like (24b) or (41d-f) don't undermine the processing account of preposition copying and pruning presented here.

A further potential empirical challenge to the processing account (and in particular, to the claim that only the preposition should normally be copied) is posed by the following examples:

(47) (a)   It's the four outfield players that count, [**of which** Joe Cole has got to be one *of them*] (Listener, phone-in, BBC Radio 5)

(b)   Is it Fernando Alonso's team, or is it Ferrari's team, **of which** Fernando Alonso is just part *of* it (David Croft, BBC Radio 5)

(c)   It's based on a series of novels by Peter Robinson, [**of which** I've read quite a few *of them*] (TV critic, BBC Radio 5)

(d)   We offer cutting edge dance routines, **of which** that performance is one *of them* (Sadlers Wells Director, BBC Radio 5)

The predictions are met in (47) insofar as the preposition has been copied here, but the wh-pronoun *which* has not (because a structure like *of which Joe Cole has got to be one of which* would have resulted in an illicit wh-chain containing two operators and no variable). However, what remains to be explained is why *them* should occur after the preposition. One possibility is that the speaker may have forgotten that there was a fronted constituent (assuming instead that it was "...*and* Joe Cole has got to be one of them"). Another is that use of *them* reflects a local repair attempt, with the speaker in (47a) first copying the preposition and then trying to repair the incomplete-sounding local string *has got to be one of...* by adding *them* as well (perhaps because *one of them* is a high frequency collocation in English, and thus might be a lexically stored unit that's easily retrievable as a whole.)

Another possibility is that *them* is a resumptive pronoun used to repair an island violation.[15] What kind of island violation? The answer may lie in (a generalised version of)

---

[15]   On the use of resumptives in wh-clauses, see Jespersen (1927), Ross (1967, 1986), Kroch (1981), Prince (1990), Harris (1993), Miller (1993), Alexopoulou & Keller (2002), and Loock (2005, 2007, 2010).

Ross's (1967, 1986) COMPLEX NP CONSTRAINT, which for present purposes can be formulated as follows:[16]

(48)   No constituent can be subextracted out of a constituent embedded within a nominal

Suppose that the string *one of which* has a structure along the lines shown below

(49)   [$_{QP}$ [$_Q$ one] [$_{PP}$ [$_P$ of] which]]

Movement of *which* on its own would violate the constraint (48), because *which* would be extracted out of a PP (*of which*) which is embedded internally within a nominal QP (*one of which*). The speaker therefore preposes the whole PP *of which*. However, in the mistaken belief that he has preposed only *which*, he attempts to repair the island violation by using the pronoun *them*. This would be consistent with the view that resumptives are used to save island violations (Ross 1967, Kroch 1981 – but see Alexopoulou & Keller 2007). Evidence has been accumulating that many types of island effect arise because of processing limitations (e.g. Kluender 2004, Hofmeister & Sag 2010), and resumptives might then be found in island environments, instead of a wh-trace, because the intended wh-chain cannot be established, in order to satisfy local subcategorisation etc. requirements. During language production under processing pressure, and with speakers unable to plan their sentences very far ahead (especially during sports commentaries), we might expect real-time wh-chain formation to be sloppy, or vulnerable to planning errors (resulting in P-copying or pruning), or to break down altogether (resulting in the use of resumptives or triggering restarts) more often than normal.

Some empirical support for the *island repair* analysis of sentences like (47) suggested here comes from the observation that subextraction of a wh-pronoun out of a [bracketed] prepositional phrase headed by *of* embedded inside a [bracketed] nominal leads to the use of a resumptive pronoun in sentences such as the following:

(50)   (a)   England have only picked 4 bowlers for this match, **which** [two [of *them*]] are
             inexperienced (Geoff Boycott, BBC Radio 5)

---

[16] Ross's Complex NP Constraint amounts to positing that nothing can be subextracted out of a
      clause embedded within a nominal.

(b)   I spoke to quite a few adults **who** [not all [of *them*]] were keen on pantomime (Reporter, BBC Radio 5)

(c)   We want to save these varieties, **which** we've got [very good records [of *them*]] (Fruit grower, BBC Radio 5)

(d)   We need to think about how we deal with prisoners, **who** we must try to get [more [of *them*]] to go straight when they come out (Ken Clarke, BBC Radio 5)

(e)   This guy is working with players **that**, probably, [all eleven [of *them*]] put together wouldn't be worth a million pounds (Barry Silk, BBC Radio 5)

(f)   The most common stop phonemes in language are /p,t,k/; **which** very few languages lack [any one [of *these*]] and there are no languages that lack all three (Student exam paper, Kuha 1994)

(g)   They've got a tail **that** I'd like a bowl at [a few [of *them*]] (Geoff Boycott, BBC Radio 5 Sports Extra)

Such data lend support to the idea that resumptive pronouns in sentences like (47) are also used to repair an assumed violation of the subextraction constraint in (48).

5. Concluding remarks

This paper has reported on instances of *preposition copying* and *preposition pruning* in live, unscripted radio and TV broadcasts. We began by attempting to provide a syntactic characterisation of *preposition copying*, asking whether that it might arise (as in Berber) when a preposition is overtly spelled out on both the highest and lowest links of a movement chain; however, we noted that such an analysis would not account for why preposition copying is systematic in Berber, but highly sporadic in English. We then went on to try to characterise *preposition pruning* in syntactic terms; we considered whether it might arise via a generalised (= 'sloppy') use of a null operator, but noted that this would not account for its occurrence in clauses containing an overt wh-operator. This led us to explore the possibility that it could arise via sloppy assignment of a theta-role to a (pronominal or nominal) argument without concomitant use of a preposition to spell out the theta-role, but we noted that this would not account for why preposition pruning only arises when the relevant constituent moves, not when it remains in situ. We subsequently turned to propose a processing account, under which preposition copying and pruning errors have a common source, and may either involve the sloppy carrying forward of clause-initial material during

the formation of filler-gap dependencies in language production, or result from the competition of two alternative structural representations during sentence planning.

The most important conclusions which emerge from our research are the following. Unlike what might be expected if the kind of utterances under investigation were simply random slips of the tongue, neither preposition copying nor preposition pruning involve the generation of locally ungrammatical structures or semantically uninterpretable sentences. That is, although prescriptively ungrammatical, both preposition copying and preposition pruning are constrained by grammatical and semantic well-formedness constraints. Secondly, considering naturally occurring but prescriptively ungrammatical wh-structures from a processing perspective can provide interesting insights into the locality of structure-building and spellout, help explain asymmetries in the relative frequency of alternative syntactic or linearisation options, and can also potentially inform models of grammatical planning.

6. References

Abels, K. (2003) *Successive Cyclicity, Anti-Locality and Adposition Stranding*, PhD diss., University of Connecticut.

Alami, L. (in prep.) *Word order, Agreement and Resumption in the Tashelhit variety of Berber*, PhD dissertation in preparation, University of Essex.

Alexopoulou, T. & Keller, F. (2002) 'Resumption and Locality: a Crosslinguistic Experimental Study', in *Papers from the 38th Meeting of the Chicago Linguistic Society* Vol. 1, University of Chicago Press, Chicago.

Alexopoulou, T. & Keller, F. (2007) 'Locality, cyclicity and resumption: At the interface between the grammar and the human sentence processor', *Language* 83: 110-160.

Aoun, J. & Li, Y.A. (2003) *Essays on the Representational and Derivational Nature of Grammar*, MIT Press, Cambridge Mass.

Arregui, A., Clifton, C., Frazier, L. & Moulton, K. (2006) 'Processing elided verb phrases with flawed antecedents: The recycling hypothesis', *Journal of Memory and Language* 55: 232–46.

Bianchi, V. (1995) *Consequences of Antisymmetry for the Syntax of Headed Relative Clauses*. PhD dissertation, Scuola Normale Superiore, Pisa.

Bianchi, V. (1999) *Consequences of Anti-symmetry: Headed Relative Clauses*, Mouton de Guyter, Berlin.

Bianchi, V. (2000) 'The raising analysis of relative clauses: A reply to Borsley', *Linguistic Inquiry* 31: 123-40.

Bolinger, D. (1961) 'Syntactic blends and another matters', *Language* 37: 366-81.

Borsley, R. (1997) 'Relative clauses and theory of phrase structure', *Linguistic Inquiry* 28: 629-647.

Borsley, R. (2001) 'More on the raising analysis of relative clauses,' unpublished paper, University of Essex [http://privatewww.essex.ac.uk/~rborsley/relatives.pdf].

Branigan, H.P., Pickering, M.J. & Cleland, A.A. (1999) 'Syntactic priming in written production: Evidence for rapid decay', *Psychonomic Bulletin & Review* 6: 535-40.

Chomsky, N. (1977) 'On wh-movement', in P.W. Culicover, T. Wasow & A. Akmajian (eds.) *Formal Syntax*, Academic Press, New York, pp. 71-132.

Chomsky, N. (1981) *Lectures on Government and Binding*, Foris, Dordrecht.

Chomsky, N. (1982) *Some Concepts and Consequences of the Theory of Government and Binding*, MIT Press, Cambridge, MA.

Chomsky, N. (1986) *Barriers*, MIT Press, Cambridge, MA.

Chomsky, N. (1995) *The Minimalist Program*, MIT Press, Cambridge, MA.

Cohen, G.L. (1987) *Syntactic blends in English parole*, Frankfurt a.M., Bern & New York, Peter Lang.

Coppock, E. (2010) 'Parallel encoding of alternatives in sentence production: Evidence from syntactic blends', *Language and Cognitive Processes* 25: 38-49.

Cutting, J.C. & Bock, K. (1997) That's the way the cookie bounces: Syntactic and semantic components of experimentally elicited idiom blends', *Memory and Cognition* 25: 57-71.

Felser, C. (2004) 'Wh-copying, phases, and successive cyclicity', *Lingua* 114: 543-74.

Ferreira, F. & Swets, B. (2002) 'How incremental is language production? Evidence from the production of utterances requiring the computation of arithmetic sums', *Journal of Memory and Language* 46: 57-84.

Fleischer, J. (2002) 'Preposition stranding in German dialects', in S. Barbiers, L. Cornips & S. van der Kleij (eds.) *Syntactic Microvariation. Online Proceedings – Workshop on Syntactic Microvariation. 30-31 August 2000*, Meertens Instituut, Amsterdam, pp. 116-151.

Franck, J., Lassi, G., Frauenfelder, U. & Rizzi, L. (2006) 'Agreement and movement: A syntactic analysis of attraction', *Cognition* 101: 173–216.

Franck, J., Soare, G., Frauenfelder, U. & Rizzi, L. (2010) 'Object interference in subject–verb agreement: The role of intermediate traces of movement', *Journal of Memory and Language* 62: 166–82.

Garrett, M.F. (1984) 'The organization of processing structure for language production: Application to aphasic speech', in D. Caplan, A. Lecours & A. Smith (eds.) *Biological Perspectives on Language*, MIT Press, Cambridge, MA, pp. 172-93.

Gibson, E. (1998) 'Syntactic complexity: Locality of syntactic dependencies', *Cognition* 68: 1-75.

Glaser, E. & Frey, N. (2007) 'Doubling phenomena in Swiss German dialects', in S. Barbiers, M. van der Ham & M. Lekakou (eds.) *European Dialect Syntax Project. Papers presented at the Workshop on Syntactic Doubling*, Amsterdam, March 2006 [http://www.meertens.knaw.nl/projecten/edisyn/].

Gries, S. (2002) 'Preposition stranding in English: predicting speakers' behaviour', in V. Samiian (ed.) *Proceedings of the Western Conference on Linguistics. Vol. 12*, California State University, Fresno, CA, pp. 230-41.

Griffin, Z.M. (2001) 'Gaze durations during speech reflect word selection and phonological encoding', *Cognition* 82: B1–B14.

Haegeman, L. (1994) *Introduction to Government and Binding Theory: Second Edition*, Blackwell, Oxford.

Harris, J. (1993) 'The grammar of Irish English', in Milroy and Milroy (eds.), pp. 139-186.

Hofmeister, P. & Sag, I. (2010) 'Cognitive constraints and island effects', *Language* 86: 366-415.

Jespersen, O. (1927) *A Modern English Grammar on Historical Principles*, vol. III, Carl Winter, Heidelberg.

Kayne, R.S. (1994) *The Antisymmetry of Syntax*, MIT Press, Cambridge Mass.

Kluender, R. (2004) 'Are subjects islands subject to a processing account?', in A. Rodriguez, V. Chand, A. Kelleher, & B. Scheiser (eds.) *Proceedings of WCCFL 23*, Cascadilla Press, Somerville, MA, pp. 475–499.

Kroch, A. (1981) 'On the role of resumptive pronouns in amnestying island constraints violations', in *Papers from the 17th Meeting of the Chicago Linguistic Society*, University of Chicago Press, Chicago, pp. 125-35.

Kuha, M. (1994) 'Attitudes towards users of co-ordinate *which*', unpublished paper, Ball State University.

Levelt, W.J.M. (1989) *Speaking: From Intention to Articulation.* MIT Press, Cambridge, MA.

Loock, R. (2005) *Appositive Relative Clauses in Contemporary Written and Spoken English: Discourse Functions and Competitive Structures*, PhD diss., University of Lille III (and UMR 8528 SILEX, CNRS)

Loock, R. (2007) 'Are you a good *which* or a bad *which*?: The relative pronoun as a plain connective' in A. Celle & R. Huart (eds) *Connectives as Discourse Landmarks* (Coollection *Pragmatics and Beyond*), Benjamins, Amsterdam, pp.71-87.

Loock, R. (2010) *Appositive Relative Clauses in English: Discourse Functions and Competing Structures*, John Benjamins, Amsterdam (Studies in Discourse and Grammar Series, no.22)

Martin, R.C., Crowther, J.E., Knight, M., Tamborello, F.P. 2nd & Yang, C.L. (2010) 'Planning in sentence production: evidence for the phrase as a default planning scope', *Cognition* 116: 77-92.

Meyer, A.S., Sleiderink, A.M. & Levelt, W.J.M. (1998) 'Viewing and naming objects: Eye movements during noun phrase production', *Cognition* 66, B25–B33.

Miller, J. (1993) 'The grammar of Scottish English', in Milroy and Milroy (eds), pp.99-138.

Milroy, J. & Milroy, L. (1993) *Real English*, Longman, London.

Newmeyer, F.J. (2003) 'On Split-CPs, uninterpretable features, and the 'Perfectness' of language', in B. Shaer, W. Frey & C. Maienborn (eds.) *Proceedings of the Dislocated Elements Workshop*, ZAS, Berlin, pp. 399-421.

Ouhalla, J. (2005) 'Clitic-placement, grammaticalization and reanalysis', in G. Cinque & R. Kayne (eds.) *The Oxford Handbook of Comparative Syntax*, Oxford University Press, Oxford, pp. 607-38.

Pesetsky, D. (1987) 'Wh-in-Situ: Movement and Unselective Binding', in E. Reuland & A. ter Meulen (eds.) *The Representation of (In)definiteness*, Cambridge, MA: MIT Press.

Pollard, C. & Sag, I. (1994) *Head-Driven Phrase Structure Grammar*, University of Chicago Press, Chicago.

Pullum, G.K. 'Could preposition doubling be headed our way?', *Language Log* May 15, 2007 04:30 pm.

Prince, E. (1990) 'Syntax and discourse: a look at resumptive pronouns', in K. Hall et al. (eds), *Proceedings of the Sixteenth Annual Meeting of the Berkeley Linguistics Society*, pp. 482-97.

Radford, A. (1988) *Transformational Grammar: An Introduction*, Cambridge University Press, Cambridge.

Radford, A. (1997) *Syntactic Theory and the Structure of English*, Cambridge University Press, Cambridge.

Radford, A. (2004) *Minimalist Syntax: Exploring the Structure of English*: Cambridge University Press, Cambridge.

Radford, A. (2009) *Analysing English Sentences*, Cambridge University Press, Cambridge.

Radford, A. (2010a) 'Real relatives: The syntax of relative clauses in live radio and TV broadcasts', talk given at *Essex Which Hunt* conference, 4 June 2010.

Radford, A. (2010b) 'The syntax of wh-clauses in live radio and TV broadcasts', paper presented at conference on *Generative Grammar in the 21st Century*, University of Essex, 7 July 2010.

Rizzi, L. (1990) *Relativised Minimality*, MIT Press, Cambridge Mass.

Ross, J.R. (1967) *Constraints on Variables in Syntax*, PhD diss., MIT.

Ross, J.R. (1986) *Infinite Syntax*, Ablex Publishing Corporation, Norwood, New Jersey.

Safir, K. (1986) *Syntactic Chains*, Cambridge University Press, Cambridge.

Shapiro, L.P., Hestvik, A., Lesan, L. & Garcia, A.R. (2003) 'Charting the time-course of VP-ellipsis sentence comprehension: Evidence for an initial and independent structural analysis', *Journal of Memory and Language* 49: 1-19.

Smith, M. & Wheeldon, L.R. (1999) High level processing scope in spoken sentence production. *Cognition* 73: 205-246.

Staum, L. & Sag, I.A. (2008) *Antilocality in ungrammaticality: nonlocal grammaticality violations are easier to process*. Poster presented at CUNY 2008 in Chapel Hill, North Carolina.

Stemberger, J.P. (1982) 'Syntactic errors in speech', *Journal of Psycholinguistic Research* 11: 313–45.

Stowell, T. (1981) *Origins of Phrase Structure*, PhD diss., MIT.

Vergnaud, J.-R. (1974) *French Relative Clauses*. PhD diss., MIT.

Wagner, V., Jescheniak, J.D. & Schriefers, H. (2010) 'On the flexibility of grammatical advance planning during sentence production: Effects of cognitive load on multiple lexical access', *Journal of Experimental Psychology: Learning, Memory, and Cognition* 36: 323-340.

Warren, T. & Gibson, E. (2002) 'The influence of referential processing on sentence complexity', *Cognition* 85: 79-112.

Zwicky, A.M. (2002) 'I wonder what kind of construction that this example illustrates', in D. Beaver, L.D. Casillas Martínez, B.Z. Clark & S. Kaufmann (eds.) *The Construction of Meaning*, CSLI Publications, pp.219-248.