Clefts and preposition omission under sluicing

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Abstract
This work argues against analyzing the possibility of preposition omission under sluicing as categorically dependent on the availability of preposition stranding under wh-movement. In particular, I demonstrate the descriptive inadequacy of the cleft analysis proposed for Polish sluicing in order to account for the environments tolerating preposition omission. Data from four acceptability judgment studies are presented in support of this argument. These data indicate that the pattern of preposition omission in Polish is graded, and reflects the linguistic complexity of correlates and sluicing remnants. One way of capturing these findings is, I propose, by connecting the availability of preposition omission in sluicing to general cognitive mechanisms involved in anaphoric processing.

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1. Introduction

There are three syntactic approaches to the resolution of elliptical constructions.1 The first one, a Direct Interpretation approach, assumes that an ellipsis remnant has no more structure than is visible, and receives an interpretation from the surrounding context (Ginzburg and Sag, 2000; Culicover and Jackendoff, 2005). On the second approach (an LF-copying approach), the structure of a remnant clause includes an L(logical) F orm representation copied from the antecedent (Williams, 1977; Chung et al., 1995, 2011). This representation is used to retrieve an interpretation for the remnant clause. The third approach, whose viability is my focus here, analyzes ellipsis remnants as arising from full underlying sources through movement and deletion (Merchant, 2001). This approach thus assumes that unpronounced syntactic material exists in the syntax of elliptical constructions.

The third approach has been motivated by the presence of connectivity effects (Merchant, 2001; van Craenenbroeck, 2010a, b). These effects are due to similarities between the syntactic behavior of ellipsis remnants and that of corresponding phrases in nonelliptical clauses. Thus if connectivity effects arise, they provide evidence for full structure underlying ellipsis remnants. For example, Merchant (2001) argues that the pattern of preposition omission in the elliptical construction sluicing, shown in (1), correlates with the possibility of preposition stranding under wh-movement in nonelliptical clauses.

(1) I knew the Body Shop was bought out by someone, but I didn’t know (by) who.

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1 I do not discuss here semantic accounts of the way elliptical constructions are resolved, such as Dalrymple et al. (1991) or Hardt (1993).
Sluicing is a construction, named thus by Ross (1969), where a remnant wh-phrase is left stranded and whose interpretation is supplied by the surrounding context. As a means to capture the cross-linguistic behavior of sluicing, Merchant (2001) formulates the Preposition-Stranding Generalization (henceforth PSG). That is, a language that allows preposition stranding under wh-movement also allows preposition omission under sluicing. In contrast, a language without preposition stranding under wh-movement disallows preposition omission under sluicing, because preposition-less remnants cannot be derived via the mechanism of movement and deletion. These patterns, together with the proposed underlying structures for the sluicing remnants, are illustrated in (2) and (3) from English and Polish, respectively.

(2) a. Who was the Body Shop bought out by?
   b. I knew the Body Shop was bought out by someone, but I didn’t know who.

(3) a. *Kogo został wykupiony Body Shop przez?
   who.ACC was bought out Body Shop by
   b. *Wiedziałam, że Body Shop został wykupiony przez kogoś,
   I knew that Body Shop was bought out by someone.
   ale nie wiedziałam kogo Body Shop został wykupiony przez.  
   but not I knew who.BY Body Shop was bought out by

The generalization that only preposition-stranding languages tolerate preposition omission under sluicing, if correct, motivates the claim that a sluiced clause has syntactic structure equivalent to that of an interrogative clause. Despite several counterexamples to the PSG offered in the literature (Vicente, 2006, 2008; Szczegielniak, 2006, 2008; Stjepanović, 2008; Fortin, 2007; Rodrigues et al., 2009; Wei, 2011; Sag and Nykiel, 2011), proponents of the deletion-based analysis of sluicing seek to account for recalcitrant data without violating the PSG. Such accounts tend to rely on the idea that underlying structures for sluicing remnants are either wh-interrogative clauses or clefts, with clefts being the back-up option (van Craenenbroeck, 2010a,b). This paper has two goals: (1) to probe the empirical adequacy of one such account, due to Szczegielniak (2008), which argues that sluicing remnants in Polish tolerate preposition omission only if underlying clefts are available that allow preposition stranding, (2) to explore whether the data pattern found in Polish is compatible with the predictions of Accessibility theory (Ariel, 1990, 1994, 2001) and with insights provided by research on memory retrieval.

Subtle properties of preposition omission under sluicing have been explored in a number of non-preposition-stranding languages, including Spanish (Vicente, 2006, 2008; Rodrigues et al., 2009), Brazilian Portuguese (Almeida and Yoshida, 2007; Lasnik, 2007; Rodrigues et al., 2009), Bahasa Indonesia (Fortin, 2007), Serbo-Croatian (Stjepanović, 2008), Czech (Caha, 2011), and Polish (Szczegielniak, 2006, 2008; Nykiel and Sag, 2009; Sag and Nykiel, 2011). According to the results, several examples are attested cross-linguistically that seemingly create exceptions to the PSG. Whether or not they truly are exceptions, these authors contend, depends on what syntactic structure is assigned to these examples, given the deletion-based analysis.

Vicente (2006, 2008), Rodrigues et al. (2009) and Szczegielniak (2006, 2008) all suggest that instances of preposition omission they have identified derive from underlying interrogative clefts that involve no violation of preposition placement, and hence, that the PSG and the deletion-based analysis of sluicing remain intact. As an illustration, consider Spanish (4) and Polish (5), where the a-sentences contain sluiced wh-phrases without prepositions and the b-sentences are the proposed underlying clefts.

(4) a. Juan ha hablado con una chica, pero no sé quién.
   Juan has talked to a girl but not know which
   ‘Juan has talked to a girl but I don’t know which.’

2 Here and throughout I use the following abbreviations: X.ACC (X is in the accusative case), X.GEN (X is in the genitive case), X.INSTR (X is in the instrumental case).

3 For the moment, I marked this sentence as incorrect, following Merchant’s argument, but I demonstrate in section 2 that such sentences are degraded, but not categorically unacceptable in Polish.

4 An anonymous reviewer points out that ‘short’ clefts (who/what it is) may possibly underlie Spanish sluices without prepositions, in which case no prepositions are involved. Such an account would, however, be limited to languages without overt case marking. A short cleft would require that the remnant be marked for nominative, but, for languages with overt case marking, remnants must match their correlates in terms of case (Ross, 1969). A similar point is raised in Vicente (2008).
b. Juan ha hablado con una chica, pero no sé cuál es la chica
Juan has talked to a girl but not know which is the girl
with that has talked Juan.

‘Juan has talked to a girl, but I don’t know which girl it is that he has talked to.’
(Rodrigues et al., 2009, ex. 4b, 6)

(5) a. Anna odpowiedziała na jakieś pytanie, ale nie pamiętam
Anna answered PREP some question.ACC but not I remember
które, which.ACC
‘Anna answered some question but I don’t remember which.’

b. Anna odpowiedziała na jakieś pytanie, ale nie pamiętam
Anna answered PREP some question.ACC but not I remember
które to na pytanie Anna odpowiedziała.
which.ACC it PREP question.ACC Anna answered
‘Anna answered some question but I don’t remember which question it was that Anna answered’

By pointing to the existence of the underlying clefts, it is possible to offer an explanation for why the wh-phrases may appear without prepositions: since the clefts can separate the prepositional heads from their dependents, so can the sluiced phrases. At first sight, these data strengthen the PSG to the extent that the correlation between preposition omission under sluicing and the availability of preposition stranding continues to hold.

Before I turn to the problems the cleft analysis faces in Polish, note that in both languages the remnants are which-NP phrases and the correlates are NPs (a girl and some question). For Polish, Szczegielniak (2008) argues that only which-NP phrases tolerate preposition omission; for Spanish, they are strongly preferred over bare wh-phrases, e.g. who and what (Rodrigues et al., 2009). Both Rodrigues et al. (2009) and Szczegielniak (2008) attribute the possibility of preposition omission in (4)–(5) to clefts that contain which-NP phrases.5 On this view, the possibility of preposition omission is linked to the syntactic form of a remnant. In this paper, I explore the possibility that preposition omission is attributable not to the syntactic form of a wh-remnant, but rather to an interaction of the semantic, syntactic, and phonological features of the remnant with the features of the correlate. When a sluicing remnant is encountered, it serves as a retrieval cue for its correlate (Poirier et al., 2010; Martin and McElree, 2011), and therefore, the form of the remnant is unlikely to be a factor in itself.

From previous research on memory retrieval, it emerges that similarity between the retrieval cue and different candidates for retrieval reduces the chances of retrieving the target phrase. On the other hand, if the target phrase shares unique features with the retrieval cue, but not with the competitors, this increases its chances of being successfully selected from among the competitors (Criss and McClelland, 2006; Nairne, 1990, 2001, 2006; Oberauer and Lewandowsky, 2008; Hofmeister et al., in press-a). In addition, Nairne (2006) argues that phrases encoding more elaborate information are in general reaccessed more easily by means of the relevant retrieval cues.

Hofmeister et al. (in press-a) suggest that the more unique syntactic and semantic information a phrase provides, the more complex it is. They further argue that more complex phrases are more accessible in working memory and retrieved more easily. Following this view, I assume that NPs serving as correlates represent a higher level of complexity than indefinite pronouns, and which-NP phrases serving as w-h-remnants represent a higher level of complexity than bare wh-phrases. This is because indefinite pronouns and bare wh-phrases only encode animacy information. Due to their greater complexity, NPs should make more accessible correlates than indefinite pronouns.

A prediction that follows from this research is that the acceptability of preposition omission with NP correlates and which-NP remnants in Polish might have an entirely non-syntactic source. Preposition omission is acceptable with which-NP phrases due to their own complexity and the complexity of their correlates. This prediction receives additional support from recent evidence that comprehension of sluicing involves a direct-access retrieval process, whereby the parser uses cues provided at the ellipsis site to directly access the antecedent (Martin and McElree, 2011).6 In such a retrieval process, memory-based constraints are at play. In particular, Martin and McElree (2011) demonstrate that additional material processed between the correlate and the remnant causes interference such that the ability of the cues provided by the remnant to successfully retrieve the correlate is compromised. It is a reasonable assumption that preposition omission reduces the complexity of the remnant by reducing the set of retrieval cues available in it. However, which-NP

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5 Szczegielniak (2008:406) argues that for an underlying cleft to be available in Polish, a sluicing remnant has to be a complex DP.

6 The same process is observed in comprehension of Verb Phrase ellipsis (Martin and McElree, 2008, 2009).
phrases offer more retrieval cues than bare wh-phrases, and thereby offer easier access to the relevant correlates even in the absence of prepositions.

The source of the mediating effect of linguistic complexity is not attributable solely to the complexity of a sluicing remnant. It is common to find which-NP (or what-NP) remnants with NPs as correlates (6), but not with indefinite pronouns (7).

(6) A Fox 29 reporter was attacked by a senator, but I can’t remember (by) which (senator).

(7) *A Fox 29 reporter was attacked by somebody, but I can’t remember (by) which (senator).

Such examples suggest that the complexity of the correlate determines the form of the remnant, whether or not prepositions are retained. It would appear that the badness of (7) follows from the requirement that a sluiced phrase have a salient antecedent (Ginzburg and Sag, 2000; Merchant, 2001). The specific information expressed by the which-NP phrase is not salient in the antecedent, given the indefinite pronoun correlate, and hence, sluicing is not licensed. Example (7) can also be captured by Almor’s (1999) Informational Load Hypothesis, which states that a more elaborate anaphor cannot be licensed by a less elaborate antecedent. The contrast between (7) and (8) shows that wh-phrases are geared toward accessing their correlates, and bear semantic and syntactic features required to do so.

Based on research by Hofmeister et al. (in press-a), we predict that increases in the complexity of the correlate could contribute to the distinctiveness of its mental representation, with the effect that it will be highly accessible for retrieval when the remnant is encountered. However, the complexity of both the correlate and remnant works in tandem to support the retrieval of the correlate. One of the goals of this paper is to explore whether the complexity of correlates and remnants only influences cases of preposition omission or whether it influences sluicing more generally.

As a final point, it is worth noting that the type of cleft shown in (5b) offers no possibility of deriving a which-NP remnant with an overt head noun. That is, the remnant które pytanie (which question) in (5b) is unavailable on the cleft analysis, given that only which may be fronted in the underlying clause. This consequence of the cleft analysis is problematic, because overt NPs are allowed in wh-remnants in Polish as much as they are allowed in other languages. This is the first reason to doubt the viability of the cleft analysis in Polish.

In the rest of this paper, I leave the case of Spanish aside, although the proposal that I argue can account for the Polish data could possibly capture Spanish better than the cleft analysis. My focus is on Polish, where it has not been established empirically that preposition omission is only available with which-NP remnants and NP correlates. Nor is it clear that clefts such as those given in (5b) are acceptable, and Szczegielniak (2008:406 fn.4) himself admits that judgments about such sentences vary.

I evaluate Szczegielniak’s (2008) cleft analysis based on the specific assumptions it makes about the acceptability of preposition omission in sluicing, and the acceptability of interrogative clefts versus sluices with and without prepositions. Using controlled acceptability judgment studies, I show that the analysis rests on inaccurate assumptions. In particular, it misrepresents the range of environments allowing preposition omission, and attributes the availability of preposition omission to the underlying cleft structure whose acceptability is questionable.

The type of cleft illustrated in (5b) and the type of sluice illustrated in (5a) should be constructions with closely overlapping representations. The crucial similarity lies in the way they both arise via movement. Szczegielniak assumes that to produce (5b), which raises out of the PP, and to produce the sluice in (5a), the rest of the clause additionally deletes. These derivations predict that acceptability ratings for clefts with preposition stranding should align with ratings for sluices without prepositions. Key to this prediction is an assumption, voiced in Snyder (2000), that if two sentences are subject to the same grammatical constraint, then speakers should perceive them as similar in acceptability.

The next prediction is that the possibility of preposition omission is categorically limited to one environment in Polish. It is unavailable for bare wh-phrases serving as sluicing remnants, as shown in (3b) and repeated here for convenience as (8), in that neither an appropriate interrogative nor cleft structure is available from which to generate the prepositionless sluice (this is also what the PSG predicts for Polish).

(8) *Wiedziałam, że Body Shop został wykupiony przez kogoś, ale
I knew that Body Shop was bought out by someone.ACC but
nie wiedziałam kogo Body Shop został wykupiony przez.
not I knew who.ACC Body Shop was bought out by

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7 Almor (1999) discusses NP anaphors, but not sluicing remnants. However, his Informational Load Hypothesis appears to make correct predictions about the behavior of other anaphoric constructions, such as sluicing.

8 Rodrigues et al. (2009) point out the failure of their proposal to account for the fact that interrogative clefts are available in Spanish for both which-NP and bare wh-phrases, while the former show a much stronger preference for preposition omission.
In the next two sections, I provide experimental evidence that both of these predictions are false. In sections 4 and 5, I begin to explore the range of contexts in which preposition omission under sluicing is found acceptable. All four sections draw on acceptability judgment data. Next, I consider the implications of the findings for theories of ellipsis. Section 7 points to directions for future research, and section 8 concludes.

2. Unacceptable or merely degraded?

On current deletion-based theories of ellipsis (Merchant, 2001, 2004), the possibility of preposition omission in ellipsis is categorical and syntactic in nature. It is available just in case preposition stranding is available under wh-movement in nonelliptical interrogative clauses. This predicts that if a language has an inviolable constraint on preposition stranding, it will also have an inviolable constraint on preposition omission, and hence, violation of either constraint will be a categorical violation.

Categorical violations are violations of grammatical constraints which must be satisfied. Failure to satisfy such constraints produces syntactically ill-formed sentences, whose representations are incoherent and whose acceptability does not improve in any circumstances. Some well-known categorical violations in English involve subject-verb agreement (9), Left Branch extraction (10), and multiple overt wh-movement (11), as shown below.

(9)  *Julia’s fate are somewhat familiar.
(10)  *What did Kelly get permit?
(11)  *Who whom saw on the bus?

While a competence grammar clearly includes many constraints, violation of which produces ungrammatical output, some constraints have since Chomsky (1965) been known to be graded in nature. That is, these constraints are violable to various degrees. Sentences that can violate them are associated with a scale of acceptability produced by certain manipulations which do not alter the basic structure of these sentences, but which incur the violations. Such violations are often perceived as milder than categorical violations, and are argued to require a combination of nonsyntactic explanations (pragmatic context, limitations of sentence processing, etc.) and syntactic explanations (Kluender and Kutas, 1993; Kroch, 1989; Snyder, 2000; Rizzi, 2001; Szabolcsi, 2006; Oshima, 2007; Hofmeister and Sag, 2010; Hofmeister et al., in press-a).9

For instance, Bresnan’s (2007) experimental study of the dative alternation revealed that verbs that had previously been thought to categorically disallow the double object construction, as in (12)–(13), received high acceptability ratings when embedded in this type of construction, if the indirect object was a pronoun and the direct object an NP. The structure hosting a pronoun followed by an NP (as opposed to a noun followed by an NP) is typical of the double object construction, and was indeed found to significantly improve ratings even for verbs that supposedly do not appear in this construction. This improvement translated into ratings for these verbs differing nonsignificantly from ratings for verbs that appear in the double object construction but were used in this study in the less typical structure (a noun followed by an NP).

(12)  *I whispered Jake the news. (cf. I whispered the news to Jake.)
(13)  *Liz pushed Jake the glass. (cf. I pushed the glass to Jake.)

By only manipulating the category of the indirect object, Bresnan (2007) kept constant the syntax of the double object construction. Hence, she demonstrated that verbs do not categorically fall into the class that may appear in the double object construction or the one that may not. Rather, any verb may appear in this construction, but its acceptability will be affected by features of the context.

Another example of gradience in the grammar emerges from research on Superiority violations (SUVs) in multiple wh-questions. SUVs are produced by illicit movement of the lower wh-phrase over the higher one, as in (15). Compare (15) with the grammatical example in (14).

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9 Snyder (2000) argues that the acceptability of sentences that represent noncategorical violations improves with exposure to similar structures encountered in the same task (this is the ‘syntactic satiation effect’). Categorical violations, however, do not show this effect. For a critique of this conclusion, see Sprouse (2007). For evidence that ungrammatical, though comprehensible, sentences may receive higher ratings with repeated exposure, see Hofmeister et al. (in press-b).
14. I need to know who will bring what.

15. *I need to know what who will bring.

It was first noticed by Karttunen (1977) that which-NP phrases are better than bare wh-phrases in SUVs, as in (16).  

16. I need to know which dish who will bring.

This raises the question of whether SUVs are categorical violations, if the ban on them may be lifted in this context. Hofmeister et al. (in press-a) offer experimental evidence showing that SUVs are indeed alleviated by the complexity of wh-phrases. That is, phrases of the form what- or which-NP raise acceptability judgments and lower reading times for items such as (16), as opposed to (15), where both interrogative pronouns are bare wh-phrases. Hofmeister et al. (in press-a) interpret these results as indicating that what-NP and which-NP phrases are easier to process at the point that they are retrieved from memory. Hence, sentences shown in (15) are not blocked by grammatical constraints, but are simply more difficult to process than sentences shown in (16).

Finally, there is growing recognition that some island violations, too, lead to various degrees of acceptability, either than the categorical grammatical/ungrammatical distinction. An acceptability contrast has been noticed between strong and weak islands, such that extraction out of the latter produces mildly unacceptable outcome. For instance, extraction out of the tenseless wh-clause in (17) receives higher acceptability ratings than extraction out of the tensed wh-clause, a strong island, in (18) (see Hofmeister and Sag (2010) for an overview).

17. This is the computer that I need to know what to do with.

18. *This is the computer that I need to know what Sally did with.


The impossibility of preposition omission under ellipsis has been attributed to the same invariable constraint that accounts for the impossibility of preposition stranding in nonelliptical interrogative clauses (Merchant, 2001, 2004). But no study of the two phenomena, to the best of my knowledge, has compared their acceptability in a controlled manner, and hence, demonstrated that they are indeed equally unacceptable. It is possible that there is a hitherto unnoticed acceptability contrast, which would suggest that preposition omission under ellipsis represents a different kind of violation (and perhaps one that is subject to a gradient constraint) than does illicit preposition stranding in nonelliptical clauses. Should this be the case, one might begin to consider alternative, nonsyntactic explanations for the behavior of prepositions under ellipsis.

I report an acceptability judgment study addressing this issue in Polish, where preposition stranding is unavailable in all nonelliptical interrogatives. The study tests the hypothesis that if preposition omission under ellipsis and preposition stranding are subject to the same invariable constraint, they should both incur a severe penalty.

Toward this end, I use a diagnostic proposed in Gibson et al. (2012). Gibson et al. (2012) have demonstrated that island violations are judged similarly across constructions with shared representations. Among the constructions addressed in their study were three types of long-distance dependencies: wh-interrogative clauses, relative clauses, and referential dependencies between pronouns and their antecedents. These were compared with constructions with no long-distance dependencies, shown in (19). Island violations were of three types: complex-NP (20), subject-NP (21), and coordination islands (22) (an agreement violation was included as a control (23)).

19. Mary wondered whether John heard that Susan likes Mike.

20. Mary wondered who John heard the rumor that Susan likes.

21. Mary wondered who John heard that some friends of like Mike.

22. Mary wondered who John heard that Susan likes Mike and.

23. Mary wondered who John heard that Susan like.

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10 See also subsequent work by, for example, Kayne (1983) and Pesetsky (1987, 2000).
Acceptability ratings for all conditions revealed a significant correlation between relative and wh-interrogative clauses. A clear contrast was found between constructions without long-distance dependencies and both wh-interrogative clauses and relative clauses. Finally, ratings for island violations differed significantly from ratings for agreement violations. From these results, Gibson et al. (2012) concluded that the correlation found between relative and wh-interrogative clauses supports their hypothesis that acceptability judgment studies may be used for testing representational overlap between constructions.

At the same time that acceptability judgments offer insight into shared representations between constructions, they reflect the difficulty of processing these constructions. Hofmeister et al. (in press-a) demonstrate that as acceptability ratings decrease for SUVs, readings times increase, and, in fact, the former may be predicted based on the values for the latter. Accordingly, this paper uses acceptability judgment studies as a way of probing the processing costs associated with particular sluicing and cleft constructions, as well as representational overlap between them.

If the penalty for preposition omission under sluicing proves to be significantly smaller than the penalty for preposition stranding in the corresponding interrogative clauses, a syntactic connection between sluicing remnants and interrogative clauses underlying them will be questioned. Further, if preposition omission receives higher acceptability ratings, it should not be collapsed with categorial violations of the type instantiated by illicit preposition stranding in nonelliptical clauses. Rather, this finding will open up the possibility that preposition omission under ellipsis is not blocked by the grammar, but is a mild violation whose acceptability may vary depending on the contexts of use or the ease of processing.

Graded acceptability of preposition omission, if such were the case, might be related to the complexity of sluicing remnants and their correlates. Recall that there is a sharp contrast, according to Szczegielniak (2008), between which-NP remnants paired with NP correlates and bare wh-remnants paired with indefinite pronoun correlates. Consider (5a), repeated here as (24), and (25).

(24) Anna odpowiedziała na jakieś pytanie, ale nie pamiętam którą. Anna answered PREP some question.ACC but not I remember which.ACC

(25) *Anna odpowiedziała na coś, ale nie pamiętam co. Anna answered PREP something.ACC but not I remember what.ACC

Szczegielniak does not attempt to quantify this contrast by any statistical means, and he seems to imply that (25) is as degraded as any violation involving illicit preposition stranding would be. Imagine, however, that (25) was judged better than a categorial violation, but worse than (24). This would suggest that the phenomenon of preposition omission is subject to a graded constraint such that its acceptability depends on the linguistic complexity of the correlate and remnant. Whether such graded constraints are part of competence grammar or memory retrieval is then the next question. Experiment I seeks to verify whether preposition omission indeed exhibits a gradient of acceptability.

2.1. Experiment I

2.1.1. Participants

Forty University of Silesia students, all monolingual speakers of Polish, participated in exchange for credit.

2.1.2. Materials and procedures

For each token set, I constructed two pairs of sentences. The sentences in one pair differed on the criterion of whether the sluicing remnants contained a preposition (baseline) or not.11 In the second pair, the baseline was a nonelliptical interrogative clause with preposition pied-piping, while the other interrogative clause contained a stranded preposition. There were twelve token sets in total (for the list of stimuli, see Appendix A). A sample token set appears in (26). The sluicing remnants are bare wh-phrases, with indefinite pronoun correlates.

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11 All prepositions used in this experiment were monosyllabic. I chose to do this, because Sag and Nykiel (2011) had found that monosyllabic prepositions were rated worse if omitted from sluicing remnants than multisyllabic prepositions. It is important to establish empirically how the acceptability of preposition omission in the monosyllabic condition (apparently, the most degraded case) differs from the acceptability of preposition stranding in interrogative clauses. There is otherwise nothing riding on the length of Polish prepositions: all are genuine prepositions and not clitics, as shown by Borsley and Jaworska (1989).
(26)  

a. *Oliwia uderzyła głową w coś, ale nie wiem w co.*
   
   Olivia hit head in something.ACC but not I know in what.ACC
   ‘Olivia hit her head on something, but I don’t know on what.’

b. *Oliwia uderzyła głową w coś, ale nie wiem co.*
   
   Olivia hit head in something.ACC but not I know what.ACC

Sentences were presented in a questionnaire (there were four versions of it), with twelve stimuli randomly interspersed among twenty-four fillers, and preceded by six benchmark sentences. Participants rated the acceptability of each sentence on a seven-point scale, with 7 for ‘fully normal and understandable’, and 1 for ‘very odd, awkward or difficult to understand’. Given these two extremes, participants were further asked to use the middle of the scale according to their sense of how close the acceptability of sentences came to the two extremes.

Fig. 1 shows standardized acceptability scores for sluicing remnants and interrogative clauses, where preposition omission/stranding is represented as *NoP* and preposition retention/pied-piping as *P*. A mixed-effects regression model was fitted to the data, treating items and participants as random effects (see Baayen, 2008). The model crossed the factors Construction type (sluicing vs. nonelliptical interrogative clause) and Preposition placement (preposition omission vs. retention for sluicing, and preposition stranding vs. pied-piping for interrogative clauses).
2.1.3. Results and discussion

First, I observed a main effect of Construction type, such that sluicing was rated significantly higher than nonelliptical interrogative clauses ($t=4.452$; $p<.0001$). Second, there was a main effect of Preposition placement, where ratings were higher for preposition retention/pied-piping than for preposition omission/stranding in both constructions ($t=8.514$; $p<.0001$). Finally, the two main effects were quantified by a significant interaction, where the degradation caused by preposition stranding in interrogative clauses was greater than that caused by preposition omission in sluicing ($t=−4.326$; $p<.0001$).

The results of this experiment fail to support the predictions of the PSG and the deletion-based approaches to ellipsis. A significant difference was indeed observed between the penalty for preposition stranding in interrogative clauses and the penalty for preposition omission in sluicing. This finding draws into question the notion that sluicing and interrogative clauses share structural representations. For present purposes, what is most relevant about these data is that preposition omission is not a categorical violation, although it does lower acceptability ratings. Szczegielniak’s cleft analysis wrongly assumes categorical unacceptability for all remnants of the type shown in (25), and hence, is an unsatisfactory way of capturing the results of this experiment.

If underlying representations for sluicing remnants are not interrogative clauses, then an alternative explanation must be sought for the acceptability status of preposition omission, given indefinite pronouns serving as correlates and bare wh-phrases serving as remnants. One such explanation might be the difficulty of retrieving the correlates for such remnants at the ellipsis site.

To anticipate the account of preposition omission I am defending here, there is reason to believe that the difficulty of retrieving linguistic signs from memory may play a role in the resolution of ellipsis. At the point where the remnant is processed, its correlate is also retrieved. In this process, if viewed from the perspective of Accessibility theory (Ariel, 1990, 1994, 2001), a more explicit (complex) phrase serves as a more accessible antecedent for an anaphor. The anaphor in turn reflects a high degree of accessibility of its antecedent by being less explicit or complex. A less explicit (complex) antecedent, on the other hand, is retrieved by means of a more explicit anaphor. For example, the remnant’s correlate in (24) is an NP, and hence, is a more complex phrase than the indefinite pronoun in (25). That is, the NP in (24) is richer in unique semantic and syntactic information that helps anchor it as a salient and accessible correlate.

Sluicing remnants can be made or less complex, reflecting the accessibility of the correlates. Which-NP remnants are more complex (as in (24)) than bare interrogative pronouns (as in (25)), but their complexity may be manipulated. The head NPs are usually dropped, presumably to avoid the repeated name penalty. In addition, I propose that prepositions, too, are dropped in order to reduce the complexity of remnants containing which-NP phrases (a PP is more complex than an NP). These reductions in complexity are the consequence of the high-accessibility of the correlates (NPs) paired with which-NP remnants. Preposition retention in sluicing may thus be expected to co-occur with remnants referring back to low-accessibility correlates, with the effect of increasing the complexity of such remnants.

The results of Experiment I are potentially consistent with the complexity-based view of ellipsis defended here. The form of the correlate could be analyzed as the determinant of how easily it can be retrieved at the ellipsis site, and of how explicit the remnant needs to be to successfully retrieve that correlate. Whether this is so may be further explored by means of follow-up acceptability judgment studies, to which I turn next.

3. Clefts vs. sluices

In this section I investigate how interrogative clefts such as those shown in (5b) fare when contrasted with sluicing with which-NP phrases. To be able to make larger comparisons across cleft and sluicing constructions, I added two controls: (1) cleft interrogatives with bare wh-phrases, shown in (27), and (2) corresponding sluices with bare wh-phrases (see 26a, b). This type of cleft interrogative should be a categorical violation, as much as any nonelliptical interrogative clause with preposition stranding would be, but its sluicing counterpart is not, as was shown by the results of Experiment I. Clefts with preposition pied-piping and sluiced phrases with prepositions represent fully acceptable constructions, and both are treated as the baseline here.

\[ (27) \quad *\text{Co to na Anna odpowiedała?} \]
\[ \text{what.ACC it PREP Anna answered} \]
\[ \text{‘What was it that Anna answered?’} \]

The results are then used to assess the viability of Szczegielniak’s proposal regarding the cleft source for sluicing. Significant differences in acceptability ratings for the relevant clefts and sluices will question structural overlap between

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12 The repeated name penalty refers to the processing difficulty of accessing prominent antecedents by means of too explicit an anaphor. For more information, see Almor (1999), Garrod et al. (1994), Gordon et al. (1993, 1999, 2004), and Swaab et al. (2004).
representations for the two constructions. In addition, if an acceptability difference is found between sluices with which-NP phrases and sluices with bare wh-phrases, but not between corresponding clefts with which-NP phrases and clefts with bare wh-phrases, the overlap will similarly be questioned. As in Experiment 1, I analyzed all data discussed here by fitting a mixed-effects regression model to them.

3.1. Experiment II

3.1.1. Participants

Eighty monolingual speakers of Polish, who did not participate in Experiment 1, took part in this experiment.

3.1.2. Materials

Twelve experimental items were constructed consisting of four pairs of constructions. In the first pair (28a, b), interrogative cleft constructions appeared either with preposition stranding or preposition pied-piping; in the second pair (28c, d), sluiced phrases appeared with or without prepositions. In (28c, d), the sluicing remnants hosted which-NP phrases to match the which-NP phrases appearing in the cleft construction in (28a, b), which, according to Szczechgieniak, is the source for sluicing. The second type of interrogative clefts (with bare wh-phrases) hosted either preposition stranding or pied-piping (28e, f). Finally, bare wh-phrases served as sluicing remnants with or without prepositions (28g, h). Questionnaires included twelve stimuli (one sentence from each experimental item) presented in random order and interspersed with twenty-four fillers. This design enabled a direct comparison of the constructions in question. A sample experimental item is given below (see Appendix A for the full list of stimuli).

(28) a. Ktöre to na pytanie Anna odpowiedziała? which it PREP question.ACC Anna answered ‘Which question was it that Anna answered?’
b. Na ktöre to pytanie Anna odpowiedziała? PREP which it question.ACC Anna answered
c. Anna odpowiedziała na jakieś pytanie, ale nie pamiętam Anna answered PREP some question.ACC but not I remember na ktöre. PREP which.ACC ‘Anna answered some question but I don’t remember which (question).’
d. Anna odpowiedziała na jakieś pytanie, ale nie pamiętam Anna answered PREP some question.ACC but not I remember ktöre. which.ACC
e. Co to na Anna odpowiedziała? what.ACC it PREP Anna answered ‘What was it that Anna answered?’
f. Na co to Anna odpowiedziała? PREP what.ACC it Anna answered
g. Anna odpowiedziała na coś, ale nie pamiętam na Anna answered PREP something.ACC but not I remember PREP co. what.ACC
h. Anna odpowiedziała na coś, ale nie pamiętam Anna answered PREP something.ACC but not I remember co. what.ACC

The procedures were identical to Experiment I. Fig. 2 shows standardized acceptability scores for all eight conditions. Preposition omission/stranding appears as NoP, and preposition retention/pied-piping is indicated as P. The two types of cleft constructions are indicated as which-NP cleft and wh cleft; the two types of sluicing appear as which-NP sluice and wh sluice.

3.1.3. Results and discussion

A main effect of Preposition placement was observed such that preposition omission/stranding was worse than preposition retention/pied-piping (t=10.195, p<.00001). There was also a main effect of Construction type such that clefts
with which-NP phrases were rated worse than either type of sluicing (which-NP sluice: \( t=7.199, p<.00001 \); wh sluice: \( t=5.098, p<.00001 \)), and unreliable different than clefts with bare wh-phrases \((t=.078, p=.938)\). Sluicing with which-NP phrases was better than sluicing with bare wh-phrases \((t=-2.101, p=0.038)\). A Construction type \(\times\) Preposition placement interaction revealed that preposition omission was significantly better in all sluices than preposition stranding in clefts with which-NP phrases \((t=-6.796, p<0.00001\); wh sluice: \( t=-5.366, p<0.0001 \), but the two cleft constructions did not differ in terms of ratings for preposition stranding \((t=-0.440, p=.660)\). In addition, pairwise \( t \)-tests show that preposition stranding in clefts with which-NP phrases received significantly lower ratings compared to the baseline, that is, preposition pied-piping in the same clefts \((t_1=32.522, df=11, p<.001; t_2=32.894, df=9, p<.0001)\). For sluicing in the corresponding condition, ratings for preposition omission did not differ from ratings for the baseline (preposition retention) by items \((t_1=1.0398, df=11, p=.320)\), and differed by subjects \((t_2=3.0870, df=9, p<.02)\). Interestingly, preposition pied-piping was rated significantly better in the which-NP cleft construction than preposition retention in sluicing with which-NP remnants \((t_1=3.0693, df=11, p<.05; t_2=8.3529, df=9, p<.001)\). This suggests that the effect of complexity is weak or even absent in sluices that retain prepositions. I return to this issue in section 4.

Only one aspect of these data is consistent with the cleft analysis of sluicing. Preposition omission does not affect ratings for sluicing if the correlates are NPs and remnants which-NP phrases. From this, I conclude that preposition omission is fully acceptable for sluicing with this type of correlate and remnant. This result is expected, given the cleft analysis, but the significant difference in acceptability between all sluices without prepositions and which-NP clefts with preposition stranding (which are the purported underlying sources for sluices with which-NP remnants) is not. Equally unexpected is the significantly degraded acceptability of preposition stranding across all clefts. This shows that the status of which-NP clefts with preposition stranding is indistinguishable from the status of other wh-clefts with preposition

\[\text{Fig. 2. Standardized acceptability scores (scale 1-7) for clefts (preposition stranding vs. preposition pied-piping) and sluicing remnants (preposition omission vs. preposition retention).}\]

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\[\text{13 Quite tellingly, a Google search did not produce any interrogative clefts with preposition stranding other than Szczegielniak's own examples.}\]
strandings, which are categorically unacceptable constructions. This leaves no legitimate underlying source from which to derive prepositionless remnants in sluicing.

An explanation for these unexpected results is that Polish lacks the possibility of extracting constituents out of a complement of a PP. This constraint applies to whole NP-complements as much as it applies to leftmost constituents of NP-complements (Corver, 1992). To illustrate, (29), from Corver (1992, ex. 33a), exemplifies extraction of the entire NP-complement, and (30)–(31), also from Corver (1992, ex. 34a, 34b), exemplify extraction of the leftmost constituents of the NP-complements.


(30) *Jakim on mieszka na piętrze? what he lives on floor.LOC ‘On what floor does he live?’

(31) *Dużym on mieszkał w domu w czasie swojej młodości. large he lived in house.LOC during his youth ‘He lived in a large house during his youth.’

The ill-formedness of all these examples is undone by pied-piping the prepositions with the extracted constituents, as (32)–(34) show.


(33) Na jakim on mieszka piętrze? on what he lives floor.LOC ‘On what floor does he live?’

(34) W dużym on mieszkał domu w czasie swojej młodości. in large he lived house.LOC during his youth ‘He lived in a large house during his youth.’

While Szczegielniak’s (2008) acceptability judgments for examples like (30) and (33) agree with Corver’s, he offers no explanation for how or why the ban on extraction of leftmost constituents of NP-complements of PPs is voided in the cleft-like construction in (28a). Indeed, given the well-formedness of (28b) (parallel to the well-formedness of (33)), (28a) is unlikely to be acceptable.

Before proceeding, an aside is in order concerning independent evidence Szczegielniak (2008) provides in support of the cleft analysis. This evidence is linked to multiple sluicing, island constraints, and the difference between sluicing and Verb Phrase Ellipsis (VPE). I first turn to multiple sluicing.

Szczegielniak (2008, ex. 14a) argues that an NP remnant may not serve as the second remnant under multiple sluicing in Polish. This is shown in (35).

(35) Jan napisał jakiś list do jakiegoś ucznia ale nie wiem który *(do) which
Jan wrote some letter to some student but not I know which *(to) któryrego.
which
‘Jan wrote some letter to some student but I don’t know which letter to which student.’

Note that only the second remnant has a PP correlate, and hence, the issue of preposition omission arises for this remnant, but not for the first one. Szczegielniak’s explanation for the badness of preposition omission in (35) is that a cleft is unavailable as the source for multiple remnants.

There are two problems with this argument. The first problem is that Szczegielniak leaves it unclear whether preposition omission under multiple sluicing is only bad if the second remnant appears without a preposition. It seems that
if both remnants have PP correlates, the first remnant may be prepositionless (this is based on informal judgments provided by my informants). Consider (36).

(36) *Emily czeka na jakąś wiadomość od jakiegoś klienta, ale nie*
    Emily waits for some message.ACC from some client.GEN but not
    wiem którą wiadomość od którego klienta.
    I know which message.ACC from which client.GEN
    ‘Emily is waiting for a message from a client, but I don’t know which message from which client.’

By removing the second remnant from (36), we can generate regular sluicing with preposition omission, similar to the items tested in Experiment II (see (28d)):

(37) *Emily czeka na jakąś wiadomość od jakiegoś klienta, ale nie*
    Emily waits for some message.ACC from some client.GEN but not
    wiem którą.
    I know which.ACC
    ‘Emily is waiting for a message from a client, but I don’t know which (message)’

If (36) and (37) both tolerate preposition omission, but only (37) has a cleft source, multiple sluicing provides no support for Szczegielniak’s argument. While multiple sluicing remains beyond the scope of the current study, note that (36) is consistent with the finding (yielded by Experiment II) that a prepositionless which-NP remnant is acceptable if it has a complex correlate, such as an NP.\(^{14}\)

The second problem with using multiple sluicing as supporting evidence for the cleft analysis is that the impossibility of preposition omission under this type of sluicing is not unique to Polish. Stjepanović (2008:181), for instance, points out that the same holds true of multiple sluicing in Serbo-Croatian. Example (38) illustrates this impossibility (Stjepanović, 2008, ex. 11).

(38) *Neko je glasao protiv nečega, ali ne znam ko*
    someone is voted against something but not I know who.NOM
    *(protiv) čega.*
    *(against) what.GEN
    ‘Someone voted against something, but I don’t know who against what.’

Strikingly, the impossibility to omit prepositions under multiple sluicing in Serbo-Croatian is entirely independent of whether wh-interrogatives or clefts serve as sources for sluiced phrases in that the latter sources, according to Stjepanović (2008), are unavailable in this language.

Another language in which multiple sluicing is subject to a similar constraint is English. Lasnik (in press, Appendix B) presents experimental evidence that a PP remnant (39), serving as the second remnant, is significantly better than an NP remnant (40) under multiple sluicing.\(^{15}\) Importantly, English does not allow clefts as sources for sluicing remnants (Merchant, 2001), and hence, as is the case with Serbo-Croatian, the preference for PP remnants must be an independent characteristic of multiple sluicing.

(39) *Someone talked about something, but I can’t remember who about what.*

(40) *Someone saw something, but I can’t remember what.*

While more research is needed on multiple sluicing, it appears that the second remnant does not easily allow preposition omission, a pattern observed cross-linguistically.

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\(^{14}\) My informants suggest that the remnants in (36) are better if the NPs (message and client) are overt. I leave the correctness of this observation for future inquiry.

\(^{15}\) Note, however, that the PP remnant’s correlate in (39) is a PP and the NP remnant’s correlate in (40) is an NP. Given this configuration, PP and NP remnants are not compared in the context of the same correlate. See also Bolinger (1978), who was the first to notice the preference for PP remnants over NP remnants in English multiple sluicing.
The second strand of evidence in support of the cleft analysis comes from island violations. Sluicing is well known to repair such violations. Szczegielniak finds that, unlike regular sluicing, multiple sluicing is unable to repair islands in Polish, and attributes this inability to the lack of an appropriate cleft source for multiple sluicing. However, the example Szczegielniak (2008, ex. 17) offers to illustrate this point is (41), where the correlates for the two remnants appear in separate tensed clauses. This configuration, as observed by Takahashi (1994) and Merchant (2001), produces a degradation in the acceptability of multiple sluicing. Whether this is a general property of multiple sluicing or indeed the consequence of multiple sluicing lacking cleft sources remains unclear.

(41) *Oni chcą wynająć któregoś tłumacza co mówi jakimś dialektem
   they want hire some translator who speaks some dialect
   balkanskim, ale nie wiem którego którym.
   Balkan, but not I know which which
   **They want to hire a translator who speaks a Balkan dialect, but I do not know who which.’

Finally, Szczegielniak notes that VPE, unlike regular sluicing, does not repair island violations. He again seeks an explanation for this pattern in the inability of VPE to derive from clefts. This picture is far from clear, however, given that English VPE – but not sluicing – fails to repair islands as well, although neither sluicing nor VPE have clefts as their underlying sources. I conclude from this discussion that Szczegielniak (2008) merely points to certain correlations which would exist between clefts and sluicing, if the former were acceptable constructions, without providing conclusive evidence that the cleft analysis is correct.

Turning back to the results of Experiment II, similar to the results of Experiment I, they provide empirical evidence against assuming shared structural representations between sluicing and nonelliptical interrogative clauses. In particular, the results point to, pace Szczegielniak (2008), a machinery for accounting for the grammar of sluicing that does not involve cleft constructions.

Combined, Experiments I and II demonstrate that an account of Polish sluicing must explain the impact of different levels of linguistic complexity of the correlate and remnant on the acceptability of preposition omission without reliance on constraints regulating preposition placement in nonelliptical clauses. Thus far, the data indicate that NP correlates and which-NP remnants without prepositions are better than indefinite pronoun correlates and bare wh-remnants without prepositions. As a follow-up on Experiments I and II, I explore whether the two types of correlates and remnants delimit a space of linguistic complexity rather than point to a two-way split.

4. The space of linguistic complexity

In this section, I report an experimental study designed to probe the effect of linguistic complexity. It investigates the acceptability of preposition omission in sluicing, given which-NP remnants whose correlates are NPs and bare wh-remnants whose correlates are indefinite pronouns. These types of phrases represent two levels of complexity, with possibly still more levels falling in between. In an effort to begin to delineate the space of complexity, I included in this experiment a third construction, where indefinite pronouns with modifying adjectives served as correlates for bare wh-remnants.

Indefinite pronoun correlates mark the lower bound of complexity in sluicing, are associated with low degrees of accessibility, and, therefore, are recovered with more complex cues, that is, with PP remnants. NP correlates mark the upper bound of complexity. are high in accessibility, and require remnants to provide fewer retrieval cues, which results in preposition omission. One pressing question then is: Are there any additional levels in between these two levels of complexity? And if so, the effect of linguistic complexity on sluicing could be viewed as a dynamic phenomenon, such that the form of the remnant (PP vs. NP) depends on, and may change in tandem with the changing accessibility of its correlate. The acceptability of preposition omission would, on this dynamic view, be linked to the various levels of linguistic complexity encoded in the correlates. One candidate for falling in between an NP and an indefinite pronoun is an indefinite pronoun with a post-modifying adjective. Example (42) illustrates such a phrase functioning as the correlate for the bare wh-remnant, which appears without the preposition.

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16 While correlates still more complex than the kind of NP addressed here may be envisioned as the upper bound of complexity (e.g. NPs with modifiers: Vince had lunch with a famous politician/a politician from Arkansas, but I don’t know which), any correlate must be indefinite enough that it provides a question under discussion for a remnant to pick up on.

17 See Frazier and Clifton (2011a,b) for the proposal that the interpretation of Verb Phrase ellipsis (VPE), too, is a dynamic process, sensitive to the current accessibility of the antecedent in memory.
Szczegielniak's cleft analysis predicts categorical unacceptability for preposition omission in (42), because the prepositionless remnant is not a which-NP phrase, preventing both a cleft and an interrogative clause from becoming available as an underlying source for it. But on the dynamic view of preposition omission, something red, which is clearly more complex than the indefinite pronoun something, is predicted to be the more acceptable correlate for the prepositionless remnant than something would be.

The complexity relationship of something red and an NP, say a dress, as in (43), seems somewhat less straightforward.

Intuitively, something red provides less unique information about its referent than does a dress. In this context, something red may refer to any clothes that are red: tops, hats, skirts, coats, pants, dresses, etc., but the NP a dress restricts the set of clothes to one specific type. Therefore, I hypothesized, based on the definition of complexity I adopt here, that (43) hosts the more complex correlate for the remnant than (42), and so should receive a higher acceptability rating than (42). To test this hypothesis, I ran Experiment III. The results of this experiment were also analyzed via additional modeling to determine whether linguistic complexity has the same effect on the acceptability of sluices with and without prepositions.

4.1. Experiment III

This experiment replicated the methodology and design from Experiments I and II, with two exceptions. The experimental items included three pairs of sentences, and sixty University of Silesia students took part in the experiment. The six experimental conditions appear in (44) (see Appendix A for the full list of stimuli). (44a, b) represent the more complex conditions (NP correlates and which-NP remnants), and (44e, f) the less complex ones (indefinite pronoun correlates and bare wh-remnants). (44c, d) are conditions whose complexity is predicted to fall in between the NP and pronominal conditions. I dub the conditions in (44c, d) modified pronominal conditions.

(a) Byłaś ubrana w coś czerwonego tamtej nocy, ale nie
you were dressed in something.ACC red.ACC that night but not
pamiętam co.
I remember what.ACC
‘You were dressed in something red that night, but I don’t remember what.’

(b) Byłaś ubrana w jakąs sukienkę tamtej nocy, ale nie pamiętam
which.ACC
you were dressed in a dress.ACC that night but not I remember
która.
which.ACC
‘You were dressed in some dress that night, but I don’t remember which.’

(c) Byłaś ubrana w coś czerwonego tamtej nocy, ale nie
you were dressed in something.ACC red.ACC that night but not
pamiętam co.
I remember what.ACC
‘You were dressed in something red that night, but I don’t remember what.’

(d) Byłaś ubrana w coś czerwonego tamtej nocy, ale nie
you were dressed in something.ACC red.ACC that night but not
pamiętam w którą.
I remember which.ACC
‘You were dressed in some dress that night, but I don’t remember which.’

(e) Byłaś ubrana w coś tamtej nocy, ale nie pamiętam
you were dressed in something.ACC that night but not I remember
co.
what.ACC
‘You were dressed in something that night, but I don’t remember what.’
Fig. 3 shows standardized acceptability scores for sluices in the six conditions. The NP conditions are represented as NP, and the two pronominal conditions as ModPron (with adjectival modifiers) and Pron. Preposition omission and retention are indicated as NoP and P, respectively.

4.1.1. Results and discussion
Consistent with my hypothesis, I found a main effect of Construction type, that is, of complexity such that the NP conditions were rated better than the modified pronominal conditions (t=3.463, p<.00001). And the modified pronominal conditions were in turn rated better than the pronominal conditions (t=−2.709, p<.0001). There was also a main effect of Preposition placement, where preposition omission was more degraded than preposition retention (t=6.821, p<.00001). According to pairwise comparisons, an unreliable difference was found between omitting prepositions and retaining them (baseline) for NP correlates and which-NP remnants (t1=1.8053, df=11, p=.05; t2=1.2299, df=9, p=.249). For the modified pronominal condition, the corresponding difference was marginally significant by items (t1=2.4694, df=11, p=.031) and only significant by subjects (t2=5.775, df=9, p<.001). However, pronominal correlates and bare wh-remnants revealed a significant difference between preposition omission and retention as the baseline (t1=5.6267, df=11, p<.0002; t2=7.9148, df=9, p<.0001). Finally, preposition omission was the most acceptable in the NP condition, and worst in the pronominal condition, which was quantified by a significant Preposition omission x Construction type interaction (t=−3.534, p<.00001).

A follow-up analysis was conducted to determine whether the effect of complexity extends beyond preposition omission, surfacing in sluiced phrases across-the-board. To do this, I removed all prepositionless remnants from the data file, and fitted a mixed-effects model to the remaining items. There were no significant differences observed between the three conditions, and trends quite unlike those found in the prepositionless sluices emerged. The NP condition was worse than both the modified pronominal condition (t=−1.696, p=.090) and the pronominal condition (t=−0.638, p=.524). The modified pronominal condition was better than the pronominal condition (t=1.058, p=.291).

These results confirm the hypothesis that preposition omission is rated better for more complex correlates and remnants than for less complex ones. Indeed, there was only a small and nonsignificant penalty for preposition omission in the most complex condition, that is, NP correlates and which-NP remnants (which was first observed in Experiment II and then reappeared in this experiment). The pattern for acceptability ratings went in the predicted direction: there was a downward trend in acceptability, reflecting the decreasing complexity of the correlates for prepositionless remnants. An additional analysis of sluiced phrases with prepositions revealed that such phrases are not sensitive to the complexity of their correlates, leaving no reason to doubt that the effect of complexity is unique to prepositionless sluices.18 What this additional analysis also shows, however, is that the highest level of complexity, which led to the highest ratings for preposition omission, resulted in the lowest ratings for preposition retention. While this result did not reach statistical significance, it suggests that complexity has the opposite effect on preposition-retaining sluices: PPs hosting which-NP phrases accumulate too many retrieval cues, giving rise to a penalty much like the repeated-name penalty.

As predicted by the dynamic view of preposition omission, there was some degradation, revealed by regression modeling and the pairwise t-tests, in the acceptability of preposition omission in the modified pronominal condition compared to the acceptability of preposition omission in the NP condition (there was also an acceptability difference between preposition omission and the baseline in the modified pronominal condition). But the modified pronominal condition received significantly higher ratings for preposition omission than the pronominal condition. Given Szczegielniak’s analysis, the ratings for preposition omission in the modified pronominal condition were surprisingly

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18 For evidence that manipulations of linguistic complexity do not have a general alleviating effect on all violations in Polish, see (Sag and Nykiel, 2011). The acceptability of preposition omission was tested in sprouting (i–ii), a construction that categorically disallows preposition omission, and shown to remain unaffected by differences in remnant complexity (which-NP remnants vs. bare wh-remnants).

(i) Ekspedient się, zdenerwował, ale nie wiem *(na) którego klienta.
assistant REFL got angry but not I know *(with) which customer.AC
'The assistant got angry, but I don’t know with which customer.'

(ii) Ekspedient się, zdenerwował, ale nie wiem *(na) kogo.
assistant REFL got angry but not I know *(with) who.AC
'The assistant got angry, but I don’t know with who.'
high, because a bare wh-remnant, whatever its correlate, should categorically disallow preposition omission. It is clear that the predictions of the cleft analysis again fail to align with the experimental data.

Together, the results of Experiment III demonstrate that indefinite pronouns with modifiers make significantly better correlates for prepositionless remnants than bare indefinite pronouns. Given that neither type of correlate leads to categorical unacceptability for preposition omission, only the dynamic view captures the effect of correlate complexity on speakers’ perception of the acceptability of preposition omission. The space of linguistic complexity is shown here to involve a gradient of syntactic forms rather than a two-way division into complex and noncomplex forms.

Thus far, the experimental results reveal that the effect of linguistic complexity is in part driven by the correlate. It appears that the correlate must be located in the clause preceding the remnant rather than the one following it (as in reverse sluicing) for the effect of complexity to be observed. The proposal outlined in section 2 predicts that a reordering of the correlate and remnant should cancel out the advantage associated with processing the correlate prior to encountering the remnant. The form of a wh-phrase serving as the remnant should not play any role in reverse sluicing, because its referent is not established until the correlate is encountered.

On the deletion-based approach, the cleft analysis included, however, the different orders of the correlate and remnant are irrelevant to the acceptability of preposition omission. Which-NP remnants without prepositions are expected to be equally good, whether they precede their correlates or follow them, because their underlying sources remain constant. Section 5 offers experimental data addressing this issue.

5. Regular vs. reverse sluicing

I collected acceptability judgments about two subtypes of sluicing. One is what I dub regular sluicing and the other reverse (or cataphoric) sluicing, where the remnant precedes the correlate, as shown in (45) and (46) (see Giannakidou and Merchant, 1998; Gullifer, 2004).
The homeowner wasn’t sure why, but his house had been snuck into the previous night. (Gullifer, 2004, ex. 5)

I don’t know with what, but I was totally frustrated with something that I couldn’t really point out. (http://www.thedailystar.net/campus/2009/02/03/feature sleepless.htm)

The pattern of acceptability we have seen so far suggests that the effect of complexity should not be observed under reverse sluicing, because the order of the correlate and remnant is reversed. The correlate, no matter how complex, is processed after the remnant, not prior to it, and cannot influence the realization of the remnant through the same process of encoding and retrieval that is evoked under regular sluicing.

Unlike in regular sluicing, the remnant conveys the information that there is an upcoming correlate. Intuitively, it must be held in working memory until the correlate is located and matched with it. One would expect that a remnant with a preposition might facilitate the search for the correlate, and so, might be the preferred option. A prepositionless remnant must be held in memory until it can be assigned syntactic and semantic properties, some of which depend on the governing preposition (e.g. attachment) and some on the verb (e.g. thematic role). Adjacency of the preposition and the remnant avoids some of these unassignments, reducing the overall processing load.19 Perhaps it is for this reason that reverse sluicing is rare and tends to host the phrase why (which unambiguously functions as an adverbal), and who functioning as the subject (Gullifer, 2004).

In Experiment IV, I investigated the acceptability of Polish wh-remnants with and without prepositions that were cataphoric to their correlates. I assumed that effects due to low frequency of reverse sluicing, if any, would show whether a preposition was present or not, enabling valid statistical comparisons.

5.1. Experiment IV

This experiment replicated the methodology of the previous experiments, and its 2 × 2 design crossed Preposition placement with Construction type, where the latter reflected correlate placement (regular vs. reverse sluicing) and the form of wh-remnant and correlate (which-NP remnant and NP correlate vs. bare wh-remnant and indefinite pronoun correlate). Remnants with prepositions in both reverse and regular sluicing were the baseline. The reverse sluicing conditions are shown in (47a, b) and (47c, d), and the regular sluicing conditions, serving as controls, are shown in (47e, f) and (47g, h).

Acceptability judgments were delivered by eighty University of Silesia students, who did not participate in any of the previous experiments. Sample stimuli are shown below (see Appendix A for the full list).

(47) a. Nie pamiętam na które, ale Anna odpowiedziała na jakieś not I remember PREP which.ACC but Anna answered PREP some pytanie. question.ACC
   ‘I don’t remember which, but Anna answered some question.’

b. Nie pamiętam które, ale Anna odpowiedziała na jakieś not I remember which.ACC but Anna answered PREP some pytanie. question.ACC

c. Nie pamiętam na co, ale Anna odpowiedziała na not I remember PREP what.ACC but Anna answered PREP coś something.ACC
   ‘I don’t remember what, but Anna answered something.’

d. Nie pamiętam co, ale Anna odpowiedziała na coś. not I remember what.ACC but Anna answered PREP something.ACC

e. Anna odpowiedziała na jakieś pytanie, ale nie pamiętam Anna answered PREP some question.ACC but not I remember na które. PREP which.ACC
   ‘Anna answered some question, but I don’t remember which.’

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19 The idea that orders in which anaphors precede their antecedents are costly in terms of property assignment is due to Hawkins (2002, 2004).
f. **Anna odpowiedziała na jakieś pytanie, ale nie pamiętam**
   Anna answered PREP some question.ACC but not I remember which.ACC

g. **Anna odpowiedziała na coś, ale nie pamiętam**
   Anna answered PREP something.ACC but not I remember PREP co.
   ‘Anna answered something, but I don’t remember what.’

h. **Anna odpowiedziała na coś, ale nie pamiętam**
   Anna answered PREP something.ACC but not I remember co.

The results of this experiment are shown in Fig. 4. Preposition omission is indicated as NoP and preposition retention as P. The regular sluicing conditions appear as Reg and the reverse conditions as Rev, while the form of wh-remnant and correlate is indicated as Which-NP and Wh.

5.1.1. Results and discussion

I observed no effect of Preposition placement, although there was a trend for remnants with prepositions to receive higher ratings than remnants without prepositions (t=1.872; p=.06). There was, however, a main effect of Construction type. Unsurprisingly, regular sluicing with NP correlates and which-NP remnants was rated significantly better than regular sluicing with indefinite pronoun correlates and bare wh-phrase remnants (t=−6.247; p<.0001). This type of sluicing was also significantly better than reverse sluicing with either NP correlates and which-NP remnants (t=−2.726; p<.007) or indefinite pronoun correlates and bare wh-phrase remnants (t=−4.367; p<.0001). The effect of Construction type entered into a significant interaction with Preposition placement. Preposition omission lowered ratings for regular sluicing with indefinite pronoun correlates and bare it-phrase remnants more than it did for regular sluicing with NP correlates and which-NP remnants (t=4.840; p<.0001). Also lower than ratings for preposition omission in regular sluicing with NP correlates and which-NP remnants were ratings for reverse sluicing with NP correlates and which-NP remnants (t=4.739; p<.0001) and for reverse sluicing with indefinite pronoun correlates and bare it-phrase remnants (t=2.097; p<.04).

Additional regression modeling revealed that for reverse sluicing, preposition retention was significantly better than preposition omission (t=6.884; p<.0001). But ratings for NP correlates and which-NP remnants did not differ from ratings for indefinite pronoun correlates and bare it-phrase remnants (t=−1.853; p=.07). Nor was there a reliable interaction between preposition placement and the form of correlate and wh-remnant: preposition omission received similar ratings across both forms (t=−1.771; p=.08).

A rather different pattern emerged for regular sluicing. Preposition omission was not worse than preposition retention (t=1.860; p=.06). However, NP correlates and which-NP remnants received significantly higher ratings than indefinite pronoun correlates and bare it-phrase remnants (t=−6.204; p<.0001), and, confirming the results of the initial analysis, preposition omission was significantly more degraded in the indefinite pronoun/bare it-phrase condition (t=4.808; p<.0001).

These results provide support for the processing advantage of correlates appearing prior to remnants. Prepositionless which-NP remnants were rated significantly better than bare it-phrase remnants, if paired with NP correlates under regular sluicing, an effect which disappeared under reverse sluicing. This means that the form of a wh-remnant matters insofar as it aids in recovering the preceding correlate; without it, the acceptability of a which-NP remnant is indistinguishable from the acceptability of a bare wh-remnant.

Note, however, that there was a significant preference across all remnants for retaining prepositions in reverse sluicing. This preference most likely follows from remnants being recovered here instead of their correlates, while the latter provide retrieval cues for them. As discussed earlier in this section, the presence of prepositions might help speakers identify the function of the remnants early on.

It is quite clear that the degradation in the acceptability of preposition omission for all remnants under reverse sluicing is unrelated to the unavailability of preposition stranding in Polish. If it was, preposition omission would have the same effect on regular sluicing as it does on reverse sluicing. I conclude that the deletion-based approach lacks a principled means to differentiate between the behavior of reverse and regular sluicing.

The different behavior of reverse and regular sluicing is easily captured on the complexity-based approach: the effect of complexity occurs only if the correlate precedes the remnant, and it does so as part of the process whereby the remnant provides retrieval cues for the correlate.
6. General discussion

The experiments presented here provide clear answers to the issues addressed in section 1. The first one was that the predictions of the deletion-based treatments of sluicing (Merchant, 2001), including the cleft analysis (Szczegielniak, 2008), may not align with empirical data. The second issue was whether the availability of preposition omission under sluicing may be more adequately captured by the mechanisms involved in memory retrieval than by the deletion-based approach.

As for the first issue, the accuracy of the cleft analysis, as well as the deletion-based analysis in general, is questioned by the experimental data. On these analyses, the availability of preposition omission is categorical (though its use, of course, needn’t be). In Polish, it is viewed as categorically dependent on the form of the remnant, and ultimately on the underlying source for it. No room is left here for a gradient of environments tolerating preposition omission, none of which, as the experiments clearly demonstrate, reach categorical unacceptability. Moreover, I found evidence that preposition stranding is unacceptable in cleft constructions across-the-board, including the which-NP clefts analyzed as underlying fully acceptable sluicing remnants without prepositions. Because the cleft analysis crucially relies on an acceptability difference between this type of cleft and unacceptable clefts with bare wh-phrases, the viability of this analysis is challenged by the current data.

A new finding to be gleaned from the current data is that the form and placement of the correlate is more central to the acceptability of preposition omission than the form of the wh-remnant. While which-NP remnants were confirmed to receive high ratings whether with or without prepositions, bare wh-remnants without prepositions were significantly more degraded when paired with bare indefinite pronouns as correlates than with modified indefinite pronouns. Furthermore, the placement of the remnant before the correlate caused a degradation in the acceptability of preposition omission.
across-the-board. These findings draw into question an account of preposition omission that focuses on the form of the sluicing remnant, while overlooking the form and placement of the correlate.\(^{20}\)

The syntactic form of the correlate reflects its linguistic complexity, influencing the acceptability of preposition omission. There is experimental evidence that when resolving anaphors, speakers access their antecedents in real time (Shapiro and Hestvik, 1995; Shapiro et al., 2003; Poirier et al., 2010; Martin and McElree, 2011). There is also corpus evidence that the more complex an antecedent is, the easier it is to retrieve it, and the less complex an anaphor is used to retrieve it (Ariel, 1990, 2001). The current data strongly suggest that speakers’ willingness to omit prepositions from sluicing remnants closely tracks the differential complexity of retrieving correlates for the remnants. Because preposition retention produces more complex remnants (a PP is more complex than an NP due to conveying more syntactic and semantic information), it is the preferred option for less complex correlates, which are less accessible to the parser. Preposition omission serves the purpose of producing a less complex remnant in case an accessible correlate is available in the surrounding discourse. As noted in section 1, ample evidence from research on memory retrieval points to the beneficial effect that the encoding of complex representations has on their subsequent retrieval. Here, I propose that a correlate conveying unique semantic and syntactic features has an advantage over one that does not due to being more readily accessible for future retrieval.

However, in at least one case the effect of linguistic complexity is distributed over the correlate and remnant. Which-NP remnants normally co-occur with NP correlates, and, if prepositionless, induce only a small penalty. An arrival of an NP correlate creates an opportunity for a close match between it and the remnant (the NP is shared between them). What this means is that the correlate and the retrieval cue for it share more overt features overall: semantic (animacy and the set delineated by the shared NP), syntactic (syntactic category), and phonological (the head NP). In comparison, an indefinite pronoun correlate and a bare wh-remnant share semantic (animacy) and syntactic (syntactic category) features, but not phonological ones. It is known from the processing literature that the more overlapping features are encoded in target phrases to be retrieved from memory and in phrases used to retrieve them, the better the match between them (Nairne, 2006). The presence of prepositions in which-NP remnants, which are already more complex than bare wh-phrases by virtue of the features encoded in them, further increases their complexity and the match with their NP correlates, but the current data show that these increases are not necessary for successful retrieval of the correlates. Hence, the complexity of an NP correlate and overlapping features between it and a complex which-NP remnant both contribute to the ease of retrieving the correlate, and by doing so, support preposition omission.

This raises the question of whether the processing advantage is still present, given implicit NP-sharing such that the shared NP is expressed covertly in the remnant, as in (44a, b), or replaced by the anaphor one. Some insight into this issue comes from Frazier and Clifton (2011a,b), who report that which one and which-NP remnants receive the same acceptability ratings when paired with NP correlates (preposition omission is not involved in this study). Such evidence suggests that the presence of which in a remnant is in itself sufficient to cue the parser to the remnant and correlate’s overlapping features. As a follow-up on these results, one could begin to pull apart effects of correlate/remnant complexity and of remnant complexity, if any, on preposition omission. Predictably, if the information assumed by a which-NP remnant is not accessible in the correlate, and a pronounal correlate would be a case in point (see (7)), a which-NP remnant does not appear in natural data. What this means is that presumably no beneficial effects are associated with a which-NP remnant unless an NP is available as a correlate for it.

It is instructive to take a closer look at what role prepositions play in sluicing remnants. Hawkins (2004) argues that in filler-gap dependencies (e.g. wh-interrogative clauses and relative clauses) preposition pied-piping helps the processor identify the function of the displaced phrase (filler) relative to the predicate. Consider (48) from Hawkins (2004:204–205).

\[(48)\]
\[\begin{align*}
\text{a. Which student did you ask John about } \_? \\
\text{b. About which student did you ask John } \_?
\end{align*}\]

The stranded prepositional object in (48a) could be mistakenly interpreted as the indirect object of ask, for example, which is prevented by pied-piping the preposition with it, as in (48b). Hawkins argues that preposition pied-piping is the majority pattern across languages due to the processing advantage of using it, but may be modulated by language-

\(^{20}\) See Frazier and Clifton (2002, 2011a,b) for the proposal that from the processing point of view, which-NP phrases receive immediate discourse representations alongside syntactic representations, which makes them easier to process than bare wh-phrases in embedded and non-embedded interrogative clauses, and in sluicing. This proposal appeals to memory retrieval, but focuses on the form of the wh-phrase, and not the correlate in sluicing.
specific features, such as the fact that prepositions are dependent on verbs for their interpretation (e.g. in English). If this is the case, preposition stranding will be preferred.\(^{21}\)

The use of PPs in sluicing appears to be associated with a similar processing advantage. By retaining prepositions speakers point to the remnant’s correlate, using cues that ensure that more syntactic and semantic features are shared by both the remnant and the correlate. For example, in cases where a prepositional object has been misheard or misunderstood, a remnant requesting clarification, that is a reprise utterance, shows a statistically significant preference for retaining prepositions in English (Nykiel, 2012).\(^{22}\)

(49)  
A: Mostly Sharon got on her bandwagon about Missus Jackson, and I just about came...  
B: About who? (Santa Barbara)

(50)  
A: But he couldn’t get along with Aguilar.  
B: With who? (Switchboard)

This preference presumably serves to ensure unambiguous identification of the remnant’s correlate in a clarificational context. In nonclarificational contexts, we would expect a preference for preposition omission if the correlate is independently made accessible by some other means, that is, by manipulations of its linguistic complexity, as discussed above.

Further support for this identifying function of prepositions is found in the apparent inability of sprouting to license preposition omission (for discussion of the impossibility of preposition omission under sprouting, see Chung, 2006; Chung et al., 2011). Example (51) instantiates sprouting, where the remnant has no overt correlate.

(51)  
I said I’m going fishing. And she said with who? (COCA: Corpus of Contemporary American English)

I propose that there are two reasons why the preposition with is deemed mandatory. First, in the absence of an overt correlate, the function of the remnant could be misidentified as the subject of go fishing, if the preposition was missing (cf. I said I’m going fishing. And she said who?). Second, Accessibility theory associates nonexplicit phrases with low accessibility for future reference, and in this case, predicts that the form of the remnant should reflect the low accessibility of its covert correlate. The lowest possible degree of accessibility of the absent correlate and the potential difficulty of interpreting the remnant are likely to have been conventionalized as categorically requiring preposition retention.

Overall, the approach to preposition omission I am defending here takes into account the dynamic dimension of this phenomenon. It can naturally accommodate multiple levels of linguistic complexity (though these are constrained by the nature of particular constructions), to which the possibility of preposition omission is shown to owe its graded character. This is an attractive ability that helps avoid the difficulties that the deletion-based approach faces as the consequence of making appeal only to the syntax of interrogative clauses or clefts in accounting for the availability of preposition omission. If the possibility of preposition omission is instead linked to the complexity of correlates and wh-remnants, then the grammar of Polish sluicing needs to place no restrictions whatever on preposition omission as it shifts the burden of explaining the data onto the process of memory retrieval.

This theoretical conclusion is consistent with the Direct Interpretation approach (e.g. Ginzburg and Sag, 2000), where the sluicing remnant is interpreted by being matched with its correlate, the salient utterance provided by the antecedent. An intuitive extension of this approach would be to allow the salience of the correlate to be modulated by manipulations of its linguistic complexity. The pattern of preposition omission revealed by the current data would then follow straightforwardly.

One could imagine that the sensitivity of preposition omission to levels of linguistic complexity could similarly be incorporated into the Focus condition on IP ellipsis articulated by Merchant (2001:31). Here, deletion is licensed by the e-givenness requirement, given in (52).

(52)  
An expression E counts as e-given iff E has a salient antecedent A and, modulo ∃-type shifting,  
(i) A entails F-clo(E), and  
(ii) E entails F-clo(A)

The linguistic complexity of a correlate embedded in an antecedent could be interpreted as contributing to the antecedent’s salience. The pattern of preposition omission found in the current data could then be explained simply by

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\(^{21}\) English is an example of a language where prepositions are indeed dependent on verbs for their interpretation, which is a consequence of the development of prepositional verbs in the Middle English period (c. 1150–1500).

\(^{22}\) These examples come from three corpora of spoken American English: Santa Barbara, Switchboard, and the Corpus of Contemporary American English.
appeal to different levels of the complexity of the antecedent. However, the effect of linguistic complexity patterns differently in sluices with prepositions and in those without, making complexity difficult to incorporate into the general notion of salience without challenging the PSG, and with it independent support for deletion-based approaches. I conclude that Polish stands as a genuine counterexample to the PSG.

7. Future research

The complexity-based explanation for the possibility of preposition omission under Polish sluicing points to a direction for future research regarding the cross-linguistic behavior of sluicing.

If the possibility of preposition omission in Polish is linked to variables involved in memory retrieval, the same should hold true of other languages, whether they allow preposition stranding under wh-movement or not. The recent literature on elliptical constructions is not inconsistent with the complexity-based explanation. For example, Rodrigues et al. (2009) point out that which-NP phrases without prepositions are more acceptable sluicing remnants than bare wh-phrases in Spanish (though not in Brazilian Portuguese), but neither type of wh-phrase is categorically unacceptable. On the assumption that which-NP remnants only appear with NP correlates and bare wh-phrases usually with pronominal correlates, this pattern is expected.

Similarly, Caha (2011) argues that in Czech, which-NP remnants may appear without prepositions, but bare wh-remnants may not. No underlying cleft source has, to the best of my knowledge, been proposed for Czech sluicing, and the acceptability status of prepositionless remnants in Czech has not been clarified in a controlled manner.

I know of one experimental study of German, due to (Frazier et al., in press), which finds that remnants without prepositions are significantly worse than remnants with prepositions as answers to non-wh-questions. Example (53) illustrates.

(53) A: Haben Sie mit dem MANN gesprochen? B: Nein, mit der
   woman.DAT
   A: have you with the man.DAT spoken B: no with the
   ‘A: Did you speak with the man? B: No, with the woman.’

This study relies on the assumption that sluicing and fragment answers are derived in the same way, that is, through movement and deletion (see Merchant, 2004). This study does not tell us, however, how unacceptable remnants without prepositions are with respect to nonelliptical clauses with preposition stranding.

A study of both sluicing and fragment answers in English (see Nykiel, 2012) shows that the effect of linguistic complexity is observed in corpus and experimental data. A statistical analysis of these data confirms that the linguistic complexity of the correlate has a significant influence on the pattern of preposition omission.23

One point to be gleaned from this research is that further work is needed as a means to explore whether preposition omission in the languages listed in Merchant (2001) as support for the PSG constitutes violation of the same grammatical constraint as the one regulating preposition placement in nonelliptical clauses.

8. Conclusion

Since Merchant (2001) a correlation has been recognized between the availability of preposition omission under sluicing and the availability of preposition stranding under wh-movement in interrogative clauses, and with it connectivity effects. To the extent that individual languages may make use of underlying structures such as interrogative clefts in place of wh-interrogative clauses, connectivity effects have not been questioned. In this paper, I have reevaluated the evidence for an underlying cleft structure in Polish as per Szczegielniak (2006, 2008). Based on experimental data, I have argued that Polish lacks an acceptable cleft structure from which to derive sluiced phrases without prepositions. Preposition omission is possible above and beyond the one context where, according to Szczegielniak, clefts are also available, further challenging the cleft-based explanation. Taken together, my data speak against including Polish among languages that lend support to the PSG.

23 Further discussion of English is beyond the scope of this paper, but see Nykiel (2012) for a proposal that what underlies greater freedom to use prepositionless remnants in English than in languages without preposition stranding is the development of semantic dependencies between verbs and prepositions, but not the possibility of preposition stranding under wh-movement itself. Such dependencies are also known to affect the pattern of preposition stranding (Hoffman, 2011), placement of postverbal PPs (Hawkins, 2000), and verb-particle constructions (Wasow, 2002).
I have offered a new perspective on the pattern of preposition omission under sluicing in Polish by linking it to the process of encoding and recovering antecedents with varying degrees of accessibility. Integrated into the Direct Interpretation approach to sluicing, this proposal has empirical coverage that the deletion-based accounts lack.

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Appendix A. Experimental materials

A.1. Experiment I stimuli

(1) a. W co Adam był wtedy ubrany? in what.ACC Adam was then dressed
b. Co Adam był wtedy ubrany w? what.ACC Adam was then dressed in

(2) a. W co spadochroniarze wpadali lądując? in what.ACC parachuters hit coming down
b. Co spadochroniarze wpadali w lądując? what.ACC parachuters hit in coming down
c. Lądując, spadochroniarze wpadali w coś, ale nie wiem coming down parachuters hit in something.ACC but not I know what.ACC

d. Lądując, spadochroniarze wpadali w coś, ale nie wiem w coming down parachuters hit in something.ACC but not I know in what.ACC

(3) a. W co Oliwia uderzyła głową? in what.ACC Oliwia hit head
b. Co Oliwia uderzyła głową w? what.ACC Oliwia hit head in
c. Oliwia uderzyła głową w coś, ale nie wiem co. Oliwia hit head in something.ACC but not I know what.ACC

d. Oliwia uderzyła głową w coś, ale nie wiem w co. Oliwia hit head in something.ACC but not I know in what.ACC

(4) a. Na kogo Sonia się gapiła na imprezie? at who.ACC Sonia REFL stared at party
b. Kogo Sonia się gapiła na imprezie? who.ACC Sonia REFL stared at at party
c. Na imprezie Sonia gapiła się na kogoś, ale nie wiem kogo. at party Sonia stared REFL at someone.ACC but not I know who.ACC
d. Na imprezie Sonia gapiał się na kogoś, ale nie wiem na kogo. Sonia stared at someone.REFL but not I know at kogo. who.ACC

(5) a. Z kim Emilia ma zamiar się skonsultować?
with who.INSTR Emilia has intention REFLEX consult
b. Kim Emilia ma zamiar się skonsultować z?
who.INSTR Emilia has intention REFLEX consult with

c. Emilia ma zamiar się skonsultować z kimś, ale nie Emilia has intention REFLEX consult with someone.INSTR but not wiem kim.
I know who.INSTR

d. Emilia ma zamiar się skonsultować z kimś, ale nie Emilia has intention REFLEX consult with someone.INSTR but not wiem z kim.
I know with who.INSTR

(6) a. W kim mój brat się zakochał?
with who.INSTR my brother REFLEX fell in love
b. Kim mój brat się zakochał w?
who.INSTR my brother REFLEX fell in love with

c. Mój brat się zakochał w kimś, ale nie wiem mój brat REFLEX fell in love with someone.INSTR but not I know kim.
who.INSTR

d. Mój brat się zakochał w kimś, ale nie wiem w mój brat REFLEX fell in love with someone.INSTR but not I know with kim.
who.INSTR

(7) a. Na kogo głosowało dużo ludzi?
for who.ACC voted many people
b. Kogo głosowało dużo ludzi na?
who.ACC voted many people for

c. Dużo ludzi głosowało na kogoś, ale nie pamiętam kogo.
many people voted for someone.ACC but not I remember who.ACC

d. Dużo ludzi głosowało na kogoś, ale nie pamiętam na kogo.
Many people voted for someone.ACC but not I remember for who.ACC

(8) a. Za czym nasz kiciuś biegł?
after what.INSTR our kitty chased
b. Czym nasz kiciuś biegł za?
what.INSTR our kitty chased after

c. Nasz kiciuś biegł za czymś, ale nie wiem czym.
our kitty chased after something.INSTR but not I know what.INSTR

d. Nasz kiciuś biegł za czymś, ale nie wiem za czym.
our kitty chased after something.INSTR but not I know after what.INSTR

(9) a. Od kogo dostawali listy z pogroźkami?
from who.GEN they got letters with threats
b. Kogo dostawali listy z pogroźkami od?
who.GEN they got letters with threats from
c. Dostawali listy z pogroźkami od kogoś, ale nie wiem they got letters with threats from someone.GEN but not I know kogo. who.GEN

d. Dostawali listy z pogroźkami od kogoś, ale nie wiem od they got letters with threats from someone.GEN but not I know form kogo. who.GEN

(10) a. O czym Królowa mówiła przez godzinę? about what.INSTR Queen spoke for hour
b. Czym Królowa mówiła o przez godzinę? what.INSTR Queen spoke about for hour
c. Królowa mówiła przez godzinę o czymś, ale nie Queen spoke for hour about something.INSTR but not pamiętam czym. I remember what.INSTR
d. Królowa mówiła przez godzinę o czymś, ale nie Queen spoke for hour about something.INSTR but not I pamiętam o czym. remember about what.INSTR

(11) a. Na co hipopotam napednął? on what.ACC hippo stepped
b. Co hipopotam napednął na? what.ACC hippo stepped on

c. Hipopotam napednął na coś, ale nie wiem co. hippo stepped on something.ACC but not I know what.ACC
d. Hipopotam napednął na coś, ale nie wiem na co. hippo stepped on something.ACC but not I know on what.ACC

(12) a. Od kogo Beata dostała kwiaty? from who.GEN Beata got flowers
b. Kogo Beata dostała kwiaty od? who.GEN Beata got flowers from
c. Beata dostała kwiaty od kogoś, ale nie wiem kogo. Beata got flowers from someone.GEN but not I know who.GEN
d. Beata dostała kwiaty od kogoś, ale nie wiem od kogo. Beata got flowers from someone.GEN but not I know from who.GEN

A.2. Experiment II stimuli

(1) a. Które to na pytanie Anna odpowiedziała? which it PREP question.ACC Anna answered
b. Na które to pytanie Anna odpowiedziała? PREP which it question.ACC Anna answered
c. Anna odpowiedziała na jakieś pytanie, ale nie pamiętam Anna answered PREP some question.ACC but not I remember które. which.ACC
d. Anna odpowiedziała na jakieś pytanie, ale nie pamiętam Anna answered PREP some question.ACC but not I remember na które. PREP which.ACC
e. Co to na Anna odpowiedziała? what.ACC it PREP Anna answered
f. *Na co to Anna odpowiedziała?*
   PREP what.ACC it Anna answered

g. *Anna odpowiedziała na coś, ale nie pamiętam co.*
   Anna answered PREP something.ACC but not I remember what.ACC

h. *Anna odpowiedziała na coś, ale nie pamiętam na* 
   Anna answered PREP something.ACC but not I remember PREP co. 
   what.ACC

(2) a. *Która to w marynarce Adam był wtedy ubrany?*
   which.ACC it in jacket Adam was then dressed

b. *W którą to marynarce Adam był wtedy ubrany?*
   in which.ACC it jacket Adam was then dressed

c. *Adam był wtedy ubrany w jakieś marynarce, ale nie pamiętam* 
   Adam was then dressed in some jacket.ACC but not I remember in ktorą.  
   which.ACC

d. *Adam był wtedy ubrany w jakieś marynarce, ale nie pamiętam w* 
   Adam was then dressed in some jacket.ACC but not I remember in ktorą.  
   which.ACC

e. *Co to w Adam był wtedy ubrany?*
   what.ACC it in Adam was then dressed

f. *W co to Adam był wtedy ubrany?*
   in what.ACC it Adam was then dressed

g. *Adam był wtedy ubrany w coś, ale nie pamiętam co.*
   Adam was then dressed in something.ACC but not I remember what.ACC

h. *Adam był wtedy ubrany w coś, ale nie pamiętam w* 
   Adam was then dressed in something.ACC but not I remember in co.  
   what.ACC

(3) a. *Które to w krzesło Oliwia uderzyła głową?*
   which.ACC it in chair Oliwia hit head

b. *W które to krzesło Oliwia uderzyła głową?*
   in which.ACC it chair Oliwia hit head

c. *Oliwia uderzyła głową w jakieś krzesło, ale nie wiem które.* 
   Oliwia hit head in some chair.ACC but not I know which.ACC

d. *Oliwia uderzyła głową w jakieś krzesło, ale nie wiem w które.*
   Oliwia hit head in some chair.ACC but not I know in which.ACC

e. *Co to w Oliwia uderzyła głową?*
   what.ACC it in Oliwia hit head

f. *W co to Oliwia uderzyła głową?*
   in what.ACC it Oliwia hit head

g. *Oliwia uderzyła głową w coś, ale nie wiem co.*
   Oliwia hit head in something.ACC but not I know what.ACC

h. *Oliwia uderzyła głową w coś, ale nie wiem w co.*
   Oliwia hit head in something.ACC but not I know in what.ACC

(4) a. *Którego to na faceta Sonia się gapiła na imprezie?*
   which.ACC it at man Sonia REFL stared at party

b. *Na którego to faceta Sonia się gapiła na imprezie?*
   at which.ACC it man Sonia REFL stared at party

c. *Na imprezie Sonia gapiła się na jakieś faceta, ale nie wiem* 
   at party Sonia stared REFL at some guy.ACC but not I know ktorégo.  
   which.ACC
d. Na imprezie Sonia gapila się na jakiegoś facetę, ale nie wiem na
at party Sonia stared REFL at some guy.ACC but not I know at
którego.
which.ACC

e. Kogo to na Sonia gapila się na imprezie?
who.ACC it at Sonia stared REFL at party

f. Na kogo to Sonia gapila się na imprezie?
at who.ACC it Sonia stared REFL at party

g. Na imprezie Sonia gapila się na kogoś, ale nie wiem kogo.
at party Sonia stared REFL at someone.ACC but not I know who.ACC

h. Na imprezie Sonia gapila się na kogoś, ale nie wiem na
at party Sonia stared REFL at someone.ACC but not I know at
kogo.
who.ACC

(5) a. Którym to z ekspertem Emilia ma zamiar się skonsultować?
which.INSTR it with expert Emilia has intention REFL consult

b. Z którym to ekspertem Emilia ma zamiar się skonsultować?
with which.INSTR it expert Emilia has intention REFL consult

c. Emilia ma zamiar się skonsultować z jakiemś ekspertem, ale nie
Emilia has intention REFL consult with some expert.INSTR but not
wiem którym.
I know which.INSTR

(6) a. Której to w dziewczynie mój brat się zakochał?
which.INSTR it with girl my brother REFL fell in love

b. W której to dziewczynie mój brat się zakochał?
with which.INSTR it girl my brother REFL fell in love

c. Mój brat się zakochał w jakieś dziewczynie, ale nie wiem
my brother REFL fell in love with some girl.INSTR but not I know
której.
which.INSTR

d. Mój brat się zakochał w jakieś dziewczynie, ale nie wiem
my brother REFL fell in love with some girl.INSTR but not I know
w której.
with which.INSTR

e. Kim to w mój brat się zakochał?
who.INSTR it with my brother REFL fell in love

f. W kim to mój brat się zakochał?
with who.INSTR it my brother REFL fell in love
(7) a. Którego to na polityka głosowało dużo ludzi?
which.ACC it for politician voted many people
b. Na którego to polityka głosowało dużo ludzi?
for which.ACC it politician voted many people
c. Dużo ludzi głosowało na jakiegoś polityka, ale nie pamiętam many people voted for some politician.ACC but not I remember którego.
which.ACC
d. Dużo ludzi głosowało na jakiegoś polityka, ale nie pamiętam na many people voted for some politician.ACC but not I remember for którego.
which.ACC
e. Kogo to na głosowało dużo ludzi?
who.ACC it for voted many people
f. Na kogo to głosowało dużo ludzi?
for who.ACC it voted many people
g. Dużo ludzi głosowało na kogoś, ale nie pamiętam kogo.
many people voted for someone.ACC but not I remember who.ACC
h. Dużo ludzi głosowało na kogoś, ale nie pamiętam na kogo.
many people voted for someone.ACC but not I remember for who.ACC

(8) a. Którą to za kulką nasz kicius biegał?
which.INSTR it after ball our kitty chased
b. Za którą to kulką nasz kicius biegał?
after which.INSTR it ball our kitty chased
c. Nasz kicius biegał za jakąś kulką, ale nie wiem którą,
our kitty chased after some ball.INST but not I know which.INSTR
d. Nasz kicius biegał za jakąś kulką, ale nie wiem za którą,
our kitty chased after some ball.INST but not I know after which.INSTR
e. Czym to za nasz kicius biegał?
what.INSTR it after our kitty chased
f. Za czym to nasz kicius biegał?
after what.INSTR it our kitty chased
g. Nasz kicius biegał za czymś, ale nie wiem czym,
our kitty chased after something.INST but not I know what.INSTR
h. Nasz kicius biegał za czymś, ale nie wiem za czym.
our kitty chased after something.INST but not I know after what.INSTR

(9) a. Którego to od psychopaty dostawali listy z pogroźkami?
which.GEN it from psychopath they got letters with threats
b. Od którego to psychopaty dostawali listy z pogroźkami?
from which.GEN it psychopath they got letters with threats
c. Dostawali listy z pogroźkami od jakiegoś psychopaty, ale nie they got letters with threats from some psychopath.GEN but not I wiem którego.
know which.GEN
d. Dostawali listy z pogroźkami od jakiegoś psychopaty, ale nie they got letters with threats from some psychopath.GEN but not I know from which.GEN

e. Kogo to od dostawali listy z pogroźkami? who.GEN it from they got letters with threats

f. Od kogo to dostawali listy z pogroźkami? from who.GEN it they got letters with threats

g. Dostawali listy z pogroźkami od kogoś, ale nie wiem they got letters with threats from someone.GEN but not I know kogo. who.GEN

h. Dostawali listy z pogroźkami od kogoś, ale nie wiem od they got letters with threats from someone.GEN but not I know from kogo. who.GEN

(10) a. Których to o problemach Królowa mówiła przez godzinę? which.INSTR it about problems Queen spoke for hour

b. O których to problemach Królowa mówiła przez godzinę? about which.INSTR it problems Queen spoke for hour

c. Królowa mówiła przez godzinę o jakichś problemach, ale nie Queen spoke for hour about some problems.INSTR but not pamiętam których. I remember which.INSTR

d. Królowa mówiła przez godzinę o jakichś problemach, ale nie Queen spoke for hour about some problems.INSTR but not pamiętam o których. I remember about which.INSTR

e. Czym to o Królowa mówiła przez godzinę? what.INSTR it about Queen spoke for hour

f. O czym to Królowa mówiła przez godzinę? about what.INSTR it Queen spoke for hour

g. Królowa mówiła przez godzinę o czymś, ale nie Queen spoke for hour about something.INSTR but not pamiętam czym. I remember what.INSTR

h. Królowa mówiła przez godzinę o czymś, ale nie Queen spoke for hour about something.INSTR but not pamiętam o czym. I remember about what.INSTR

(11) a. Które to na zwierzętko nadepnął hipopotam? which.ACC it on animal stepped hippo

b. Na które to zwierzętko nadepnął hipopotam? on which.ACC it animal stepped hippo

c. Hipopotam nadepnął na jakieś zwierzętko, ale nie wiem które. hippo stepped on some animal.ACC but not I know which.ACC

d. Hipopotam nadepnął na jakieś zwierzętko, ale nie wiem na które. hippo stepped on some animal.ACC but not I know on which.ACC

e. Co to na nadepnął hipopotam? what.ACC it on stepped hippo

f. Na co to nadepnął hipopotam? on what.ACC it stepped hippo

g. Hipopotam nadepnął na kogoś, ale nie wiem kogo. hippo stepped on someone.ACC but not I know who.ACC
h. *Hipopotam niedepnął na kogoś, ale nie wiem na kogo.*

hippo stepped on someone.ACC but not I know on who.ACC

(12) a. *Któżego to od kolegi Beata dostała kwiaty?*

which.GEN it from colleague Beata got flowers

b. *Od któżego to kolegi Beata dostała kwiaty?*

from which.GEN it colleague Beata got flowers

c. *Beata dostała kwiaty od jakiegoś kolegi, ale nie wiem*

Beata got flowers from some colleague.GEN but not I know któżego.

which.GEN

d. *Beata dostała kwiaty od jakiegoś kolegi, ale nie wiem od*

Beata got flowers from some colleague.GEN but not I know from któżego.

which.GEN

e. *Kogo to od Beata dostała kwiaty?*

who.GEN it from Beata got flowers

f. *Od kogo to Beata dostała kwiaty?*

from who.GEN it Beata got flowers

g. *Beata dostała kwiaty od kogoś, ale nie wiem kogo.*

Beata got flowers from someone.GEN but not I know who.GEN

h. *Beata dostała kwiaty od kogoś, ale nie wiem od kogo.*

Beata got flowers from someone.GEN but not I know from who.GEN

A.3. Experiment III stimuli

(1) a. *Tamtej nocy byłaś ubrana w jakąs sukienkę, ale nie pamiętam*

that night you were dressed in some dress.ACC but not I remember któżą.

which.ACC

b. *Tamtej nocy byłaś ubrana w jakąs sukienkę, ale nie pamiętam w*

that night you were dressed in some dress.ACC but not I remember in któżą.

which.ACC

c. *Tamtej nocy byłaś ubrana w coś czerwonego, ale nie*

that night you were dressed in something.ACC red.ACC but not pamiętam co.

I remember what.ACC

d. *Tamtej nocy byłaś ubrana w coś czerwonego, ale nie*

that night you were dressed in something.ACC red.ACC but not pamiętam w co.

I remember in what.ACC

e. *Tamtej nocy byłaś ubrana w coś, ale nie pamiętam*

that night you were dressed in something.ACC but not I remember co.

what.ACC

f. *Tamtej nocy byłaś ubrana w coś, ale nie pamiętam w*

that night you were dressed in something.ACC but not I remember in co.

what.ACC

(2) a. *Anna odpowiedziała na jakieś pytanie, ale nie pamiętam*

Anna answered PREP some question.ACC but not I remember które.

which.ACC
b. Anna odpowiedziała na jakieś pytanie, ale nie pamiętam na
Anna answered PREP some question.ACC but not I remember PREP
które. which.ACC

c. Anna odpowiedziała na coś łatwego, ale nie pamiętam
Anna answered PREP something.ACC easy.ACC but not I remember
co. what.ACC

d. Anna odpowiedziała na coś łatwego, ale nie pamiętam
Anna answered PREP something.ACC easy.ACC but not I remember
na co. PREP what.ACC

e. Anna odpowiedziała na coś, ale nie pamiętam co.
Anna answered PREP something.ACC but not I remember what.ACC

f. Anna odpowiedziała na coś, ale nie pamiętam na
Anna answered PREP something.ACC but not I remember PREP
co. what.ACC

(3)

a. Oliwia uderzyła głową w jakieś krzesło, ale nie wiem które.
Oliwia hit head in some chair.ACC but not I know which.ACC

b. Oliwia uderzyła głową w jakieś krzesło, ale nie wiem w które.
Oliwia hit head in some chair.ACC but not I know in which.ACC

c. Oliwia uderzyła głową w coś twardego, ale nie wiem
Oliwia hit head in something.ACC hard.ACC but not I know
co. what.ACC

d. Oliwia uderzyła głową w coś twardego, ale nie wiem w
Oliwia hit head in something.ACC hard.ACC but not I know in
co. what.ACC

e. Oliwia uderzyła głową w coś, ale nie wiem co.
Oliwia hit head in something.ACC but not I know what.ACC

f. Oliwia uderzyła głową w coś, ale nie wiem w co.
Oliwia hit head in something.ACC but not I know in what.ACC

(4)

a. Na imprezie Sonia gapiła się na jakiegoś faceta, ale nie wiem
at party Sonia stared REFL at some guy.ACC but not I know
którego. which.ACC

b. Na imprezie Sonia gapiła się na jakiegoś faceta, ale nie wiem na
at party Sonia stared REFL at some guy.ACC but not I know at
którego. which.ACC

c. Na imprezie Sonia gapiła się na kogoś wysokiego, ale nie wiem
at party Sonia stared REFL at someone.ACC tall.ACC but not I know
kogo. who.ACC

d. Na imprezie Sonia gapiła się na kogoś wysokiego, ale nie wiem
at party Sonia stared REFL at someone.ACC tall.ACC but not I know na
kogo. at who.ACC

e. Na imprezie Sonia gapiła się na kogoś, ale nie wiem kogo.
at party Sonia stared REFL at someone.ACC but not I know who.ACC
f. Na imprezie Sonia gapia się na kogoś, ale nie wiem na at party Sonia stared REFL at someone.ACC but not I know at kogo. who.ACC

(5) a. Emilia ma zamiar się skonsultować z jakimś ekspertem, ale nie Emilia has intention REFL consult with some expert.INSTR but not wiem którym. I know which.INSTR

b. Emilia ma zamiar się skonsultować z jakimś ekspertem, ale nie Emilia has intention REFL consult with some expert.INSTR but not wiem z którym. I know which.INSTR

c. Emilia ma zamiar się skonsultować z kimś Emilia has intention REFL consult with someone.INSTR kompetentym, ale nie wiem kim. competent.INSTR but not I know who.INSTR

d. Emilia ma zamiar się skonsultować z kimś Emilia has intention REFL consult with someone.INSTR kompetentym, ale nie wiem z kim. competent.INSTR but not I know with who.INSTR

e. Emilia ma zamiar się skonsultować z kimś, ale nie Emilia has intention REFL consult with someone.INSTR but not wiem kim. I know who.INSTR

f. Emilia ma zamiar się skonsultować z kimś, ale nie Emilia has intention REFL consult with someone.INSTR but not wiem z kim. I know with who.INSTR

(6) a. Mój brat się zakochał w jakieś dziewczynie, ale nie wiem my brother REFL fell in love with some girl.INSTR but not I know której. which.INSTR

b. Mój brat się zakochał w jakieś dziewczynie, ale nie wiem my brother REFL fell in love with some girl.INSTR but not I know w której. with which.INSTR

c. Mój brat się zakochał w kimś nowym, ale nie my brother REFL fell in love with someone.INSTR new.INSTR but not wiem kim. I know who.INSTR

d. Mój brat się zakochał w kimś nowym, ale nie my brother REFL fell in love with someone.INSTR new.INSTR but not wiem w kim. I know with who.INSTR

e. Mój brat się zakochał w kimś, ale nie wiem my brother REFL fell in love with someone.INSTR but not I know kim. who.INSTR

f. Mój brat się zakochał w kimś, ale nie wiem w my brother REFL fell in love with someone.INSTR but not I know with kim. who.INSTR
(7) a. Dużo ludzi głosowało na jakiegoś polityka, ale nie pamiętam many people voted for some politician.ACC but not I remember którego.ACC
b. Dużo ludzi głosowało na jakiegoś polityka, ale nie pamiętam na many people voted for some politician.ACC but not I remember for którego.ACC
c. Dużo ludzi głosowało na kogoś nieodpowiedzialnego, ale nie many people voted for someone.ACC irresponsible.ACC but not pamiętam kogo. I remember who.ACC
d. Dużo ludzi głosowało na kogoś nieodpowiedzialnego ale nie many people voted for someone.ACC irresponsible.ACC but not pamiętam na kogo. I remember for who.ACC
e. Dużo ludzi głosowało na kogoś, ale nie pamiętam kogo. many people voted for someone.ACC but not I remember who.ACC
f. Dużo ludzi głosowało na kogoś, ale nie pamiętam na kogo. many people voted for someone.ACC but not I remember for who.ACC

(8) a. Nasz kiciuś biegał za jakąś kulką, ale nie wiem którą. our kitty chased after some ball.INSTR but not I know which.INSTR
b. Nasz kiciuś biegał za jakąś kulką, ale nie wiem za którą. our kitty chased after some ball.INSTR but not I know after which.INSTR
c. Nasz kiciuś biegał za czymś okrągłym, ale nie wiem our kitty chased after something.INSTR round.INSTR but not I know czym. what.INSTR
d. Nasz kiciuś biegał za czymś okrągłym, ale nie wiem our kitty chased after something.INSTR round.INSTR but not I know za czym, after what.INSTR
e. Nasz kiciuś biegał za czymś, ale nie wiem czym. our kitty chased after something.INSTR but not I know what.INSTR
f. Nasz kiciuś biegał za czymś, ale nie wiem za czym. our kitty chased after something.INSTR but not I know after what.INSTR

(9) a. Dostawali listy z pogróżkami od jakiegoś psychopaty, ale nie they got letters with threats from some psychopath.GEN but not wiem którego.GEN
b. Dostawali listy z pogróżkami od jakiegoś psychopaty, ale nie they got letters with threats from some psychopath.GEN but not wiem od którego.GEN
I know from which.GEN
c. Dostawali listy z pogróżkami od kogoś miejscowego, ale they got letters with threats from someone.GEN local.GEN but nie wiem kogo. not I know who.GEN
not I know from who.GEN
d. Dostawali listy z pogróżkami od kogoś miejscowego, ale they got letters with threats from someone.GEN local.GEN but nie wiem od kogo. not I know from who.GEN
e. Dostawali listy z pogrożkami od kogoś, ale nie wiem
they got letters with threats from someone.GEN but not I know
kogo. who.GEN

f. Dostawali listy z pogrożkami od kogoś, ale nie wiem od
they got letters with threats from someone.GEN but not I know from
kogo. who.GEN

(10) a. Królowa mówiła przez godzinę o jakichś problemach, ale nie
Queen spoke for hour about some problems.INSTR but not
pamiętam których.
I remember which.INSTR

b. Królowa mówiła przez godzinę o jakichś problemach, ale nie
Queen spoke for hour about some problems.INSTR but not
pamiętam o których.
I remember about which.INSTR

c. Królowa mówiła przez godzinę o czymś ważnym,
Queen spoke for hour about something.INSTR important.INSTR
ale nie pamiętam czym.
but not I remember what.INSTR

d. Królowa mówiła przez godzinę o czymś ważnym,
Queen spoke for hour about something.INSTR important.INSTR
ale nie pamiętam o czym.
but not I remember about what.INSTR

e. Królowa mówiła przez godzinę o czymś, ale nie
Queen spoke for hour about something.INSTR but not
pamiętam czym.
I remember what.INSTR

f. Królowa mówiła przez godzinę o czymś, ale nie
Queen spoke for hour about something.INSTR but not
pamiętam o czym.
I remember about what.INSTR

(11) a. Hipopotam nadepnął na jakieś zwierzętko, ale nie wiem które.
hippo stepped on some animal.ACC but not I know which.ACC

b. Hipopotam nadepnął na jakieś zwierzętko, ale nie wiem na które.
hippo stepped on some animal.ACC but not I know on which.ACC

c. Hipopotam nadepnął na coś małego, ale nie wiem
hippo stepped on something.ACC small.ACC but not I know
co. what.ACC

d. Hipopotam nadepnął na coś małego, ale nie wiem na
hippo stepped on something.ACC small.ACC but not I know on
co. what.ACC

e. Hipopotam nadepnął na coś, ale nie wiem co.
hippo stepped on something.ACC but not I know what.ACC

f. Hipopotam nadepnął na coś, ale nie wiem na co.
hippo stepped on something.ACC but not I know on what.ACC

(12) a. Beata dostała kwiaty od jakiegoś kolegi, ale nie wiem
Beata got flowers from some colleague.GEN but not I know
którego. which.GEN
b. Beata dostała kwiaty od jakieś kolegi, ale nie wiem od którego.
Beata got flowers from some colleague.GEN but not I know from which.GEN

c. Beata dostała kwiaty od kogoś nieznajomego, ale nie wiem kogo.
Beata got flowers from someone.GEN unknown.GEN but not I know who.GEN

d. Beata dostała kwiaty od kogoś nieznajomego, ale nie wiem od kogo.
Beata got flowers from someone.GEN unknown.GEN but not I know from who.GEN

e. Beata dostała kwiaty od kogoś, ale nie wiem kogo.
Beata got flowers from someone.GEN but not I know who.GEN

f. Beata dostała kwiaty od kogoś, ale nie wiem od kogo.
Beata got flowers from someone.GEN but not I know from who.GEN

A.4. Experiment IV stimuli

(1) a. Nie pamiętam na które, ale Anna odpowiedziała na jakieś pytanie.
not I remember PREP which.ACC but Anna answered PREP some question.ACC
b. Nie pamiętam które, ale Anna odpowiedziała na jakieś pytanie.
not I remember which.ACC but Anna answered PREP some question.ACC
c. Nie pamiętam co, ale Anna odpowiedziała na coś.
not I remember what.ACC but Anna answered PREP something.ACC
d. Nie pamiętam co, ale Anna odpowiedziała na coś.
not I remember what.ACC but Anna answered PREP something.ACC
e. Anna odpowiedziała na jakieś pytanie, ale nie pamiętam
Anna answered PREP some question.ACC but not I remember PREP which.ACC
f. Anna odpowiedziała na jakieś pytanie, ale nie pamiętam
Anna answered PREP some question.ACC but not I remember PREP which.ACC
g. Anna odpowiedziała na coś, ale nie pamiętam na
Anna answered PREP something.ACC but not I remember PREP what.ACC
h. Anna odpowiedziała na coś, ale nie pamiętam
Anna answered PREP something.ACC but not I remember PREP what.ACC

(2) a. Nie pamiętam w którą, ale Adam był wtedy ubrany w jakąś
not I remember in which.ACC but Adam was then dressed in some
marynarkę.
jacket.ACC
b. *Nie pamiętam którą, ale Adam był wtedy ubrany w jakąś marynarkę,* not I remember which.ACC but Adam was then dressed in some.

jacket.ACC

c. *Nie pamiętam w co, ale Adam był wtedy ubrany w coś,* not I remember in what.ACC but Adam was then dressed in

cos.ACC

d. *Nie pamiętam co, ale Adam był wtedy ubrany w coś,* not I remember what.ACC but Adam was then dressed in

something.ACC

e. *Adam był wtedy ubrany w jakąś marynarkę, ale nie pamiętam w* Adam was then dressed in some.

jacket.ACC but not I remember in

którą.

which.ACC

f. *Adam był wtedy ubrany w jakąś marynarkę, ale nie pamiętam* Adam was then dressed in some.

jacket.ACC but not I remember

którą. which.ACC

g. *Adam był wtedy ubrany w coś, ale nie pamiętam w* Adam was then dressed in something.ACC but not I remember in

co.

what.ACC

h. *Adam był wtedy ubrany w coś, ale nie pamiętam* Adam was then dressed in something.ACC but not I remember

co.

what.ACC

(3) a. *Nie wiem w które, ale Oliwia uderzyła głową w jakieś krzesło.* not I know in which.ACC but Oliwia hit

head on some.

chair.ACC

b. *Nie wiem które, ale Oliwia uderzyła głową w jakieś krzesło.* not I know which.ACC but Oliwia hit

head on some.

chair.ACC

c. *Nie wiem w co, ale Oliwia uderzyła głową w coś.* not I know in what.ACC but Oliwia hit

head on

something.ACC

d. *Nie wiem co, ale Oliwia uderzyła głową w coś.* not I know what.ACC but Oliwia hit

head on

something.ACC

e. *Oliwia uderzyła głową w jakieś krzesło, ale nie wiem w które.* Oliwia hit

head on some.

chair.ACC but not I know in which.ACC

f. *Oliwia uderzyła głową w jakieś krzesło, ale nie wiem w które.* Oliwia hit

head on

some.

chair.ACC but not I know which.ACC

g. *Oliwia uderzyła głową w coś, ale nie wiem w co.* Oliwia hit

head on

something.ACC but not I know what.ACC

h. *Oliwia uderzyła głową w coś, ale nie wiem co.* Oliwia hit

head on

something.ACC but not I know what.ACC

(4) a. *Nie wiem na którego, ale na imprezie Sonia gapiła się na jakieśgos.* not I know at which.ACC but at party

Sonia stared REFL at some.

faceta.

guy.ACC

b. *Nie wiem którego, ale na imprezie Sonia gapiła się na jakieśgos* not I know which.ACC but at party

Sonia stared REFL at some.

faceta.

guy.ACC

c. *Nie wiem na kogo, ale na imprezie Sonia gapiła się na* not I know at who.ACC but at party

Sonia stared REFL at

kogoś.

someone.ACC
d. Nie wiem kogo, ale na imprezie Sonia-gapila się na kogoś.
   not I know who.ACC but at party Sonia stared REFL at someone.ACC

e. Na imprezie Sonia gapila się na jakiegoś faceta, ale nie wiem na
   at party Sonia stared REFL at some guy.ACC but not I know at
   którego. which.ACC

f. Na imprezie Sonia gapila się na jakiegoś faceta, ale nie wiem
   at party Sonia stared REFL at some guy.ACC but not I know at
   kogoś. who.ACC

(5) g. Na imprezie Sonia gapila się na kogoś, ale nie wiem na
   at party Sonia stared REFL at someone.ACC but not I know who.ACC
   kto´rego.
   which.ACC

h. Na imprezie Sonia gapila się na kogoś, ale nie wiem kogo.
   at party Sonia stared REFL at someone.ACC but not I know who.ACC

(6) a. Nie wiem w której, ale mój brat się zakochał w jakiejś
   not I know in which.INSTR but my brother REFL fell in love with some
   dziewczynie.
   girl.INSTR
b. Nie wiem której, ale mój brat się zakochał w jakieś
not I know which.INSTR but my brother REFL fell in love with some
dziewczynie.girl.INSTR

c. Nie wiem w kim, ale mój brat się zakochał w
not I know with who.INSTR but my brother REFL fell in love with
kimś.someone.INSTR

d. Nie wiem kim, ale mój brat się zakochał w
not I know who.INSTR but my brother REFL fell in love with
kimś.someone.INSTR

e. Mój brat się zakochał w jakieś dziewczynie, ale nie wiem w
my brother REFL fell in love with some girl.INSTR but not I know with
której.which.INSTR

f. Mój brat się zakochał w jakieś dziewczynie, ale nie wiem
my brother REFL fell in love with some girl.INSTR but not I know with
której.which.INSTR

g. Mój brat się zakochał w kimś, ale nie wiem w
my brother REFL fell in love with someone.INSTR but not I know with
kim.who.INSTR

h. Mój brat się zakochał w kimś, ale nie wiem
my brother REFL fell in love with someone.INSTR but not I know
kim.who.INSTR

(7) a. Nie pamiętam na którego, ale dużo ludzi głosowało na jakieś
not I remember for which.ACC but many people voted for some
polityka.politician.ACC

b. Nie pamiętam którego, ale dużo ludzi głosowało na jakieś
not I remember which.ACC but many people voted for some
polityka.politician.ACC

c. Nie pamiętam na kogo, ale dużo ludzi głosowało na kogoś.
not I remember for who.ACC but many people voted for someone.ACC

d. Nie pamiętam kogo, ale dużo ludzi głosowało na kogoś.
not I remember who.ACC but many people voted for someone.ACC

e. Dużo ludzi głosowało na jakieś polityka, ale nie pamiętam na
many people voted for some politician.ACC but not I remember for
którego. which.ACC

f. Dużo ludzi głosowało na jakieś polityka, ale nie pamiętam
many people voted for some politician.ACC but not I remember for
którego. which.ACC

g. Dużo ludzi głosowało na kogoś, ale nie pamiętam na kogo.
many people voted for someone.ACC but not I remember for who.ACC

h. Dużo ludzi głosowało na kogoś, ale nie pamiętam kogo.
many people voted for someone.ACC but not I remember who.ACC
(8) a. *Nie wiem za którą, ale nasz kiciuś biegał za jakąś kulką.*
not I know after which.INSTR but our kitty chased after some ball.INSTR
b. *Nie wiem która, ale nasz kiciuś biegał za jakąś kulką.*
not I know which.INSTR but our kitty chased after some ball.INSTR
c. *Nie wiem za czym, ale nasz kiciuś biegał za czymś.*
not I know after what.INSTR but our kitty chased after something.INSTR
d. *Nie wiem czym, ale nasz kiciuś biegał za czymś.*
not I know which.INSTR but our kitty chased after something.INSTR
e. *Nasz kiciuś biegał za jakąś kulką, ale nie wiem za która.*
our kitty chased after some ball.INSTR but not I know after which.INSTR
f. *Nasz kiciuś biegał za jakąś kulką, ale nie wiem którą.*
our kitty chased after some ball.INSTR but not I know which.INSTR
g. *Nasz kiciuś biegał za czymś, ale nie wiem za czym.*
our kitty chased after something.INSTR but not I know after what.INSTR
h. *Nasz kiciuś biegał za czymś, ale nie wiem czym.*
our kitty chased after something.INSTR but not I know what.INSTR

(9) a. *Nie wiem od którego, ale dostawali listy z pogroźkami od jakiegoś psychopaty.*
not I know from which.GEN but they got letters with threats from someone.GEN
b. *Nie wiem od którego, ale dostawali listy z pogroźkami od jakiegoś psychopaty.*
not I know from which.GEN but they got letters with threats from someone.GEN
c. *Nie wiem od kogo, ale dostawali listy z pogroźkami od kogoś.*
not I know from who.GEN but they got letters with threats from someone.GEN
d. *Nie wiem kogo, ale dostawali listy z pogroźkami od kogoś.*
not I know from who.GEN but they got letters with threats from someone.GEN
e. *Dostawali listy z pogroźkami od jakiegoś psychopaty, ale nie wiem od którego.*
they got letters with threats from someone.GEN but not I know from which.GEN
f. *Dostawali listy z pogroźkami od jakiegoś psychopaty, ale nie wiem od którego.*
they got letters with threats from someone.GEN but not I know from which.GEN
g. *Dostawali listy z pogroźkami od kogoś, ale nie wiem od kogo.*
they got letters with threats from someone.GEN but not I know from who.GEN
h. *Dostawali listy z pogroźkami od kogoś, ale nie wiem od kogo.*
they got letters with threats from someone.GEN but not I know from who.GEN
(10) a. Nie pamiętam o których, ale Królowa mówiła przez godzinę o jakichś problemach, not I remember about which.INSTR but Queen spoke for hour about some problems.INSTR
b. Nie pamiętam których, ale Królowa mówiła przez godzinę o jakichś problemach, not I remember which.INSTR but Queen spoke for hour about some problems.INSTR
c. Nie pamiętam o czym, ale Królowa mówiła przez godzinę o czymś, not I remember about what.INSTR but Queen spoke for hour about something.INSTR
d. Nie pamiętam czym, ale Królowa mówiła przez godzinę o czymś, not I remember about what.INSTR but Queen spoke for hour about something.INSTR
e. Królowa mówiła przez godzinę o jakichś problemach, ale nie pamiętam o których. I remember about which.INSTR
f. Królowa mówiła przez godzinę o jakichś problemach, ale nie pamiętam o których. I remember about which.INSTR
g. Królowa mówiła przez godzinę o czymś, ale nie pamiętam o czym. I remember about what.INSTR
h. Królowa mówiła przez godzinę o czymś, ale nie pamiętam o czym. I remember about what.INSTR

(11) a. Nie wiem na które, ale hipopotam nadepnął na jakieś zwierzątko. not I know on which.ACC but hippo stepped on some animal.ACC
b. Nie wiem które, ale hipopotam nadepnął na jakieś zwierzątko. not I know which.ACC but hippo stepped on some animal.ACC
c. Nie wiem na co, ale hipopotam nadepnął na coś. not I know on what.ACC but hippo stepped on something.ACC
d. Nie wiem co, ale hipopotam nadepnął na coś. not I know what.ACC but hippo stepped on something.ACC
e. Hipopotam nadepnął na jakieś zwierzątko, ale nie wiem na które. hippo stepped on some animal.ACC but not I know on which.ACC
f. Hipopotam nadepnął na jakieś zwierzątko, ale nie wiem które. hippo stepped on some animal.ACC but not I know which.ACC
g. Hipopotam nadepnął na coś, ale nie wiem na co. hippo stepped on something.ACC but not I know on what.ACC
h. Hipopotam nadepnął na coś, ale nie wiem co. hippo stepped on something.ACC but not I know what.ACC

(12) a. Nie wiem od którego, ale Beata dostrzegła kwiaty od jakiegos. not I know from which.GEN but Beata got flowers from some friend.GEN
b. *Nie wiem kórego, ale Beata dostała kwiaty od jakiegoś kolegi.*
   not I know which GEN but Beata got flowers from some friend GEN

c. *Nie wiem od kogo, ale Beata dostała kwiaty od kogoś*  
   not I know from who GEN but Beata got flowers from someone GEN

d. *Nie wiem kogo, ale Beata dostała kwiaty od kogoś.*  
   not I know who GEN but Beata got flowers from someone GEN

e. *Beata dostała kwiaty od jakiegoś kolegi, ale nie wiem od*  
   Beata got flowers from some friend GEN but not I know from którego.
   which GEN

f. *Beata dostała kwiaty od jakiegoś kolegi, ale nie wiem*  
   Beata got flowers from some friend GEN but not I know którego.
   which GEN

g. *Beata dostała kwiaty od kogoś, ale nie wiem od*  
   Beata got flowers from someone GEN but not I know from kogo.
   who GEN

h. *Beata dostała kwiaty od kogoś, ale nie wiem kogo.*  
   Beata got flowers from someone GEN but not I know who GEN

References


Lasnik, H. Multiple sluicing in English? Syntax 16(4), in press.


**Glossary**

**Sluicing**: An elliptical construction where a wh-phrase is left stranded.

**Preposition stranding**: The placement of prepositions elsewhere (often at the end of clauses) than immediately adjacent to their objects.