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On Swiping in English: A Direct Interpretation Approach*

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Kim, Jong-Bok and Kim, Jungsoo. 2020. **On Swiping in English: A Direct Interpretation Approach.** *Studies in Generative Grammar,* 30-4, 487-516. This paper concerns the so-called Swiping elliptical construction in English involving a *wh*-phrase followed by a preposition (e.g., *Where from?* as a response to *I just moved here*). The construction displays quite idiosyncratic properties in many respects: it applies only to a limited set of *wh*-expressions and prepositions, occurs only in Sluicing environments, and typically disallows an overt correlate in the antecedent clause. The paper reports a corpus investigation for the uses of the construction in real life and suggests a direct interpretation (DI) approach couched upon a construction-based HPSG framework that posits neither clausal sources nor derivational processes. It shows that the DI analysis can serve better in accounting for the semi-productive Swiping construction in English.

Keywords: ellipsis, Sluicing, Swiping, direct interpretation, corpus-based, construction-based, HPSG

1. Introduction

Sluicing is a widely recognized elliptical construction that elides everything except a *wh*-expression, as illustrated in the following (see, among others, Ross 1969, Chung et al. 1995, Merchant 2001):

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(1) a. He danced with someone yesterday, but I don't know who.
b. Ivan was eating, but I don't know what.

The embedded question in the second clause here only has a *wh*-word, but gives rise to a propositional interpretation anaphoric to the antecedent clause. Note that English also employs an intriguing construction called Swiping when Sluicing interacts with prepositions:

(2) a. He danced with someone, but I don't remember [with whom].
b. He danced with someone, but I don't remember [whom with].

In the Sluicing example of (2a), the preposition undergoes pied-piping with the *wh*-word. Our focus here is examples like (2b) where the preposition is stranded. Such examples are called Sluice-stranding (Culicover and Jackendoff 2005) or Swiping (Merchant 2002), the latter of which we use in this paper.[1]

Swiping examples as in (2b) are quite peculiar in that they invert a preposition with a sluiced *wh*-word, but are observed quite often in attested data:

(3) a. It ran off. I don't know know [where to].
b. "Package for you." He motioned with his chin. Doesn't say [who from].
c. I felt like I should apologize–though I wasn't sure [what for].

The key question that follows is then what grammatical conditions license such a construction. This paper tries to answer this licensing question. Previous studies on English Swiping overall have assumed syntactic derivations for generating the construction and provided different judgments for similar or the same Swiping examples based on researchers' own linguistic intuitions (Rosen 1976, Merchant 2002, Sprouse 2006, Hartman and Ai 2009, Radford and Iwasaki 2015). A few of them have used some corpus data gleaned from simple internet searches to support their analyses (see, among others, Merchant 2002, Hartman and Ai 2009). This calls for research on the construction on the basis of a large, balanced corpus data. To this end, in the paper we first review key grammatical properties of Swiping in English and then discuss the previous analyses of the construction, most of which are based on movement and deletion operations. We then report the findings of our corpus investigation to understand its authentic uses in real

[1] Merchant (2002) takes the term as acronym of sluiced *wh*-word inversion with preposition (in Northern Germanic).

life situations and discuss data that do not countenance the claims made by the previous literature. We also sketch an alternative direct interpretation (DI) analysis that can better address the observations we can make from the attested data in question.

2. Some Key Properties

Swiping in English exhibits several idiosyncratic properties, which distinguish the construction from other related constructions. The first peculiarity we can observe is that Swiping typically applies only to *wh*-words, as illustrated in the following (Merchant 2002, Craenenbroeck 2004):

(4) a. Lee was talking, but I don't know who to/*which student to.
b. They were complaining, but I can't remember what about/*what course about.

As shown here, Swiping seems to be applicable to *wh*-words, but not to complex *wh*-phrases like *which student* and *what course*. However, literature has noted some exceptions where Swiping occurs with a *wh*-phrase (Merchant 2002, Hartman and Ai 2009, Radford and Iwasaki 2015):

(5) a. %He's been living in Arizona, but I don't know how long for.
b. He fought in the civil war, but I don't know which side for.
c. Chrissy, nice to meet you, I recognize your name, not sure what site from, but that doesn't matter, nice to meet you regardless.
d. John is talking, but I don't know what the hell about.

Merchant (2002:294-295) notes that speakers accept Swiping with *wh*-phrases like *how long*, *how much*, and *how many* to varying degrees, with judgments best for the ones with *how long* as in (5a). Hartman and Ai (2009) also provide Swiping examples with *wh*-phrases collected from internet searches as in (5b) and (5c). Further, aggressively non-D-linked *wh*-phrases like *what the hell* can have Swiping, as in (5d) (Merchant 2002, Dikken and Giannakidou 2002, Sprouse 2006, Hartman and Ai 2009).

In addition, Swiping limits the participating prepositions. That is, only a limited set of prepositions can undergo Swiping, as shown by the contrast below (Merchant 2002, Culicover and Jackendoff 2005:30-31):

(6) a. I know they were complaining, but I'm not sure what about/*during.
b. A: I was arguing with John. B: What about/*before?

Merchant (2002) and Culicover and Jackendoff (2005) make distinctions between possible and impossible prepositions in Swiping, as given in the following:

(7) a. Possible prepositions in Swiping: *about*, *after*, *as*, *at*, *by*, *from*, *near*(?), *of*, *on*, *till*, *to*, *under*(?), *with*, ...
b. Impossible prepositions in Swiping: *above*, *because of*, *before*, *between*, *despite*, *in spite of*, *during*, *instead of*, *into*, *on top of*, *regarding*, *underneath*, ...

Next, the combination of a *wh*-expression and a preposition in Swiping seems to form a tight syntactic constituent at first glance, but there are instances where Swiping has an intervening material between the *wh*-expression and the preposition (Craenenbroeck 2004, Hartman and Ai 2009, Larson 2012, Radford and Iwasaki 2015):

(8) a. Ivy told me that Ivan was playing, but I can't remember who she said with.
b. Besides, Jisao was "invited" here. Who do you think by?
c. "Manchester United should definitely sell Rooney." "Who, in your view, to?"
d. I know they were defeated in their last three games, but I can't remember who, in their recent game, by.

As given here, a parenthetical expression may intervene between the two, implying that they are a separable syntactic unit. Swiping can also have some additional material after the preposition as in (9) (Larson 2012, Radford and Iwasaki 2015):

(9) a. Ivan talked to two people last week. I remember he talked to Ivy on Sunday, but I can't remember who to on Monday.
b. They were arguing, but I'm not sure what about exactly.

In these Swiping examples, the preposition is followed by an adjunct expression, showing that Swiping can have more material other than just the combination of a *wh*-expression and a preposition.

One intriguing property of Swiping is that it can only occur in Sluicing environments (Ross 1969, Merchant 2002, Hartman and Ai 2009). Consider the

examples below:

(10) a. [To whom] was Lois talking?
b. Whom was Lois talking to?
c. *[Who to] was Lois talking?
(11) a. I know they were arguing, but I have no idea [about what].
b. I know they were arguing, but I have no idea [what about].
c. *I know they were arguing, but I have no idea [what about] they were arguing.

Examples like (10a) and (11a) involve pied-piping, while those like (10b) and (11b) have a stranded preposition. In particular, the Swiping example in (11b) can be taken to be a type of Sluicing with the inverted preposition, namely, Swiping. The unacceptable examples in (10c) and (11c) tell us that Swiping occurs only in an elliptical environment like Sluicing that involves ellipsis in a *wh*-clause.

Consider the following *it*-cleft constructions as well:

(12) a. It was Tomas Mann [about whom] she was speaking.
b. *It was Tomas Mann [whom about] she was speaking.
c. *It was Tomas Mann [whom about].

As in (12a), the preposition can be pied-piped in the cleft clause, but Swiping is not possible in (12b) and (12c) simply because both are not Sluicing environments: the clause is not an interrogative one but a type of relative clause where the *wh*-word is not an interrogative pronoun.

Another noteworthy property of Swiping concerns the correlate linked to the *wh*-word. It has been noted that Swiping is only permitted where there is no overt correlate in the antecedent clause (Rosen 1976, Merchant 2002, Hartman and Ai 2009, Larson 2012). Compare the following Sluicing and Swiping examples:

(13) a. She was complaining about something, but I don't remember (about) what.
b. She was complaining, but I don't remember about what.
(14) a. *She was complaining about something, but I don't remember what about.
b. She was complaining, but I don't remember what about.

Examples in (13) are typical Sluicing: (13a), called merger type of Sluicing, has an overt correlate *something* linked to the *wh*-word *what* whereas (13b), called sprouting type of Sluicing, has just an implicit correlate (Chung et al. 1995). Note

that in Swiping, the merger type is not licensed with the overt correlate *something* in the antecedent clause, as shown by the contrast in (14). However, literature has also noted that merger Swiping may be possible in some contexts (Merchant 2002, Craenenbroeck 2004, Culicover and Jackendoff 2005, Craenenbroeck 2010, Vicente 2014).

(15) a. Mary fixed it with something, but God only knows what with.
b. Howard shares the apartment with someone, but I don't know who with.
c. She went somewhere, but I can't remember where to.

As suggested by Vicente (2014), such examples imply that we better treat merger Swiping examples as less acceptable than their sprouting counterparts, but not ungrammatical in an absolute sense.

Multiple Sluicing with no preposition is in general unacceptable as in (16a), but multiple pied-piped PPs are acceptable in Sluicing as in (16b) (Radford and Iwasaki 2015):

(16) a. *Someone saw something, but I can't remember [who] [what]
b. I was talking, but I can't remember [to who] [about what].

However, if we have different options for the orderings of the *wh*-expression and the preposition in this kind of example, only the left-most PP can allow Swiping (Larson 2012, Radford and Iwasaki 2015).

(17) a. Ivan was talking, but I can't remember [who to] [about what].
b. *Ivan was talking, but I can't remember [who to] [what about].
c. *Ivan was talking, but I can't remember [to who] [what about].

Swiping and pied-piping Sluicing display contrasting behavior with respect to the stress patterns as well (Rosen 1976, Merchant 2002, Hartman and Ai 2009, Radford and Iwasaki 2015).

(18) a. She fixed it, but God only knows what WITH.
b. *She fixed it, but God only knows WHAT with.
(19) a. She fixed it, but God only knows with WHAT.
b. *She fixed it, but God only knows WITH what.

As illustrated here, stress is placed on the preposition, not on the *wh*-expression

in Swiping and the reverse pattern holds for pied-piping Sluicing.

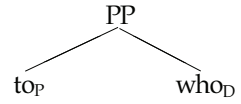
As discussed so far, Swiping, consisting of a *wh*-expression and an inverted preposition, shows several unique grammatical properties, which differentiate it from other related constructions such as pied-piping Sluicing. The notable properties we have discussed include: Swiping typically targets only a *wh*-word, occurs only in Sluicing, typically disallows an overt correlate (merger Swiping), and places a stress on the swiped preposition. In what follows, we review previous analyses of Swiping and discuss possible challenges they encounter.

3. Previous Analyses: Movement and Deletion Approaches

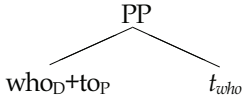
The prevailing analyses of Swiping are based on the postulation of clausal sources and movement and deletion processes. There have been two main directions with this view.

Merchant (2002) proposes a PF head movement analysis of Swiping. According to Merchant (2002), Swiping is generated via syntactic processes like pied-piping *wh*-movement, head movement of a *wh*-expression at PF, and the clausal deletion. For instance, the Swiping example *Mary was talking, but I don't know who to* would be generated by the following processes:

(20) Mary was talking, but I don't know
she was talking to who
⇒ [to who] [she was talking] (pied-piping *wh*-movement)



⇒ [who to] [she was talking] (PF head movement)



⇒ [who to] ~~[she was talking]~~ (Sluicing = clausal deletion)

As sketched here, the *wh*-word undergoes pied-piping *wh*-movement to the clause

initial position, and this is followed by PF head movement of the *wh*-word and deletion of the clause. The analysis thus limits Swiping operations only to a head expression, which may give rise to a potential issue: as noted earlier in (5), there are Swiping examples where the involved *wh*-expression is a complex phrase (e.g., *I don't know which side for*). Such a structure-based analysis is also challenged by the restrictions on the type of prepositions that can occur in Swiping. As discussed in (6) and (7), we have seen that only a limited set of prepositions can participate in Swiping. This means that the analysis needs to introduce an additional mechanism to restrict the complex syntactic operations here. In addition, it is unclear how the head movement analysis can deal with cases like (8) where a parenthetical expression intervenes between the *wh*-expression and the preposition (e.g., *I can't remember who, in their recent game, by*). If Swiping were licensed by the head movement of a *wh*-word to its selecting preposition, nothing should intervene between the two, contrary to fact.

As a way of solving such issues in the PF head movement analysis, Hartman and Ai (2009) and Radford and Iwasaki (2015) suggest a subextraction analysis involving movement operations to functional projections in generating Swiping examples. For instance, consider the derivational processs that Hartman and Ai (2009) introduce in generating a Swiping example:

(21) Mary was talking, but I don't know ...
⇒ [$_{FocP}$ [$_{PP}$ to whom] [$_{Foc}$ [she was talking t_{PP}]]] (pied-piping *wh*-movement to [Spec, FocP])
⇒ [$_{ForceP}$ [$_{NP}$ who] [$_{C}$ [$_{FocP}$ [$_{PP}$ to t_{who}] [$_{Foc}$ [she was talking t_{PP}]]]]]
(additional *wh*-movement of *wh*-expression to [Spec, ForceP])
⇒ [$_{ForceP}$ [$_{NP}$ who] [$_{C}$ [$_{FocP}$ [$_{PP}$ to t_{who}] [$_{Foc}$ ~~[she was talking t_{PP}]~~]]]]
(Sluicing = clausal deletion)

As represented here, the PP *to whom* first undergoes pied-piping *wh*-movement to FocP and then the *wh*-word alone moves to ForceP, which is followed by a clausal ellipsis. The key difference is that there is no head-movement but another *wh*-movement. The analysis then may avoid several issues arising from the PF movement analysis: it can license Swiping with a *wh*-phrase and with the preposition separated by an intervening expression.

This improved structure-based movement approach, however, still is not free from potential problems. It does not address why only a limited set of prepositions or *wh*-words participate in Swiping. The analysis predicts that as long as pied-piping *wh*-movement is available, the subsequent subextraction of the

wh-expression should be possible, generating an intermediate source structure for Swiping. This prediction does not seem to hold. Attested examples like the following indicate the possibility of pied-piping with prepositions such as *before* and *during*:[2]

(22) a. "I'm not kidding, Laura! Put it out and get up here!" "It's only a matter of time," she said. I looked at her. "Before what?" (COCA 2018 FIC)
b. And for approximately how long did this – did the as – alleged assault take place? During what? (COCA 1994 SPOK)

However, Swiping is not possible with these prepositions (**What before?* and **What during?*), as noted in (6) and (7).

4. Corpus Findings and Discussion

4.1. Corpus Used and Search Methods

In order to examine the authentic uses of Swiping and its grammatical properties further, we carried out a corpus investigation, using COCA (Corpus of Contemporary American English). To extract Swiping example from COCA, we first used simple string searches with some regular expressions as shown below:

(23) *Wh*-word + P combinations:
who|whom|whose|what|which|when|where|how|why PREP [y*]
(1,038 tokens)
(24) *Wh*-phrases + P combinations:
a. whose|which|what [nn*] PREP [y*] (9 tokens)
b. how * PREP [y*] (14 tokens)
c. who|whom|whose|what|which|when|where|how|why the hell/the heck/the f*ck/on earth/the devil PREP [y*] (40 tokens)

These simple string searches gave us a total of 1,101 tokens that match the patterns where a combination of a *wh*-expression + P ends with a punctuation

[2] COCA (Corpus of Contemporary American English) is the largest structured corpus of Contemporary American English that continues to be updated. The data we report here are from 1990 to 2018.

marker. We then manually filtered out irrelevant examples as in (25):

(25) a. "Is it on?" she asked. "Is what on?" (COCA 1996 FIC)
b. If you catch me in harpy form, we'll see who tears what off. (COCA 2008 FIC)
c. Would you really be happy here? What about ... companionship? (COCA 2010 FIC)

After filtering out such non-Swiping examples from the extracted data, we have identified a total of 941 tokens of Swiping, for which we have performed both quantitative and qualitative investigations.

4.2. Corpus-based Observations

With a total of 941 Swiping tokens, we first examined the *wh*-expressions participating in Swiping. Table 1 shows the frequencies of the Swiping examples by the type of *wh*-expressions:

Table 1. Frequencies of *Wh*-expressions in Swiping

***Wh*-word expression**	**Freq**	***Wh*-phrase expression**	**Freq**
what	686	*what the hell*	20
where	151	*what on earth*	18
who	60	*how long*	3
Total	**897**	*how much*	1
		*what the f*ck*	1
		what the heck	1
		Total	**44**

One simple observation we could make here is that, as noted in the literature, the majority of Swiping examples are with a simple *wh*-word rather than a *wh*-phrase. Examples in the following are some representative tokens:

(26) a. Hearing the news on Wall Street, are you scared? What of? (COCA 2008 SPOK)
b. "I just moved here." "Where from?" (COCA 2009 FIC)
(27) a. He said, "We're clearing out these woods." "What on earth for?"

(COCA 2011 MAG)

b. "You'll have to send us a deposit, or MasterCard or Visa," he said. "How much for?" I asked. (COCA 1990 FIC)

Table 1 further tells us that the predominant *wh*-expression (both as simple *wh*-words and as part of complex *wh*-phrases) used in Swiping is *what*, followed by *where* and *who*. In the meantime, *how* is used only as part of complex *wh*-phrases. The corpus yielded no Swiping token with other *wh*-expressions such as *whom*, *whose*, *which*, and *why*. These results seem to support the observation made in previous literature that only a limited *wh*-expressions can enter into Swiping, favoring *wh*-words rather than *wh*-phrases.

We have also identified the uses of prepositions in Swiping. Table 2 below shows the frequencies of prepositions used in the identified Swiping examples:

Table 2. Frequencies of Prepositions in Swiping

Preposition	Freq	Preposition	Freq
for	596	*of*	8
to	125	*by*	5
about	106	*in*	2
with	48	*against*	1
from	30	*on*	1
at	18	*over*	1
		Total	**941**

As seen from the table, the most frequently used preposition in Swiping is *for*, followed by *to* and *about*. Other prepositions like *with*, *from*, and *at* are also observed, but have much fewer frequencies than these major ones. Prepositions like *against*, *on*, and *over* are quite rare.[3] The differences in the uses of prepositions in Swiping are also reflected in the frequencies of their combinations with a *wh*-expression, as in Table 3:

[3] COHA (Corpus of Historical American English) also yields no Swiping tokens with these three rare prepositions.

Table 3. Frequencies of *Wh*-expression + P Combinations in Swiping

Wh-word + P	Freq	*Wh*-word + P	Freq	*Wh*-phrase + P	Freq
what for	546	*who by*	5	*what the hell for*	19
where to	114	*what from*	3	*what on earth for*	17
what about	102	*what in*	2	*how long for*	3
who with	27	*what to*	2	*how much for*	1
what with	20	*who about*	2	*what on earth with*	1
where at	18	*what against*	1	*what the f*ck for*	1
where from	17	*what on*	1	*what the heck for*	1
who from	10	*what over*	1	*what the hell about*	1
who to	9	*where about*	1	**Total**	**44**
what of	8	*where for*	1		
who for	7	**Total**	**897**		

As shown here, more than half of the identified Swiping examples from COCA involve the combination of *what* and *for*. This holds true both in the *wh*-word + P combinations and the *wh*-phrase + P combinations. Note that in most cases, the combination of *what* and *for* gives rise to an idiomatic meaning synonymous with *why* as given in (28), although it can also have a non-idiomatic, compositional meaning as in (29):

(28) a. "I've just been waiting for you." "For me? What for?" (COCA 2012 FIC)
b. I need a doctor. I don't know what for. I just need a doctor. (COCA 2011 SPOK)

(29) a. "I'm sorry," she said. "What for?" "Meg's death. She was your friend as well as mine." (COCA 1996 FIC)
b. I felt like I should apologize-though I wasn't sure what for. (COCA 2010 FIC)

We have seen that Swiping is closely related to Sluicing, and further that the previous movement analyses in general derive Swiping from pied-piped Sluicing. For this, we have investigated the uses of pied-piping Sluicing in COCA. In particular, we have checked the pied-piping patterns that match the Swiping patterns in Table 3. Table 4 shows us these patterns of pied-piping Sluicing we

identified from COCA:

Table 4. Frequencies of P + *Wh*-expression Combinations in Pied-piping Sluicing (Shaded: Top 10 Frequencies in Swiping)

P + *Wh*-word	Freq	P + *Wh*-word	Freq	P + *Wh*-phrase	Freq
for what	1,019	*from whom*	50	*at whom*	9
about what	387	*by who*	40	*for where*	9
by whom	224	*to who*	38	*of who*	9
of what	177	*in what*	36	*against who*	7
to whom	148	*with who*	35	*on who*	6
with what	141	*at what*	31	*on whom*	5
from where	122	*by what*	27	*in whom*	4
with whom	104	*from who*	25	*about who*	3
to what	97	*over what*	23	*about whom*	2
from what	96	*against whom*	20	*over whom*	2
for whom	93	*for who*	16	*at where*	1
on what	77	*of whom*	12	*at who*	1
to where	70	*against what*	100	**Total**	**3,178**

As discussed in Table 3 before, the most frequent Swiping type is *what for*. Pied-piping Sluicing also has the pattern of *for what* with the same preposition and *wh*-expression as the most frequently used type. The combinations marked with shades in the table are those also found in Swiping as seen from Table 3. In a broad sense, all the pied-piping Sluicing patterns are also found in Swiping with the same prepositions. However, as hinted earlier, Swiping patterns observed in the corpus data are much more restricted than pied-piping Sluicing: not all combination patterns in pied-piping Sluicing are observed in Swiping. For example, the combinations containing the accusative *wh*-expression *whom* are only observed in pied-piping Sluicing as in (30), but not in Swiping.

(30) a. People are getting shot. We don't know by whom. (COCA 2010 SPOK)
b. "You have a date? With whom?" (COCA 2002 FIC)
c. Sabine knew that Agnes had received a warning, but she'd never known from whom. (COCA 2010 FIC)

Further, pied-piping Sluicing patterns like *before what*, *by when*, *for which*, and *into what* are not found in Swiping:

(31) a. ... he needs to sign it. By when? (COCA 2013 SPOK)
b. She's transforming. Into what? (COCA 1997 SPOK)

One more difference between pied-piping Sluicing and Swiping concerns aggressively non-D-linked *wh*-phrases. Aggressively non-D-linked *wh*-expressions like *what the hell*, *who the heck*, and *how on earth* are unacceptable in pied-piping Sluicing (Pesetsky 1987, Dikken and Giannakidou 2002, Merchant 2002, Hartman and Ai 2009).

(32) a. John was talking, but I don't know about what.
b. *John was talking, but I don't know about what the hell.

However, as discussed earlier, previous literature has noted that Swiping can save examples like (32b) by inverting the preposition and the aggressively non-D-linked *wh*-expression (Merchant 2002, Hartman and Ai 2009).

(33) a. John was talking, but I don't know what about.
b. John was talking, but I don't know what the hell about.

Our corpus findings further support this observation made in previous literature. In COCA, aggressively non-D-linked *wh*-phrases are found in Swiping, but not in pied-piping Sluicing.

(34) a. He said, 'We're clearing out these woods.' 'What on earth for?' (COCA 2011 MAG)
b. Even from here, I can see that he's grinning. What the hell about? (COCA 2010 FIC)
c. Jimmy looked up, crying hard, and got it out: "She's gone to India." "What?" Michael nearly shouted. "India? What the hell for?" (COCA 1993 FIC)

The corpus investigation does not yield examples like *for what on earth?* or *about what the hell?*. The examples in (30)-(34) together then suggest that there cannot be one-to-one derivational processes from pied-piping Sluicing to Swiping.

We have also checked the distribution of the extracted Swiping examples in

matrix and embedded environments. Swiping can occur in both matrix and embedded environments, but it is much more preferably used in the former. A total of 833 tokens of Swiping (88.5%) occur in matrix environments whereas only 108 instances occur in embedded environments, some of which are shown in (35):

(35) a. There's a song the conference plays between program items. You don't know who by. (COCA 2018 FIC)
b. Dale had brought some rope he'd purchased and two different padlocks, although he wasn't sure what for. (COCA 2000 FIC)
c. "All's I know is they cleared out an hour ago. Paid up real quick and skedaddled." "Any idea where to?" (COCA 1993 FIC)
d. You get some steamy romantic scenes on the show. Do you get a kick out of that? It all depends on who with. (COCA 2013 MAG)

As can be seen here, Swiping can occur as the complement of a main verb, copula, adjective, noun, and preposition, indicating that it can occur in a variety of embedded environments.

As noted earlier, one intriguing property of Swiping is that the construction disprefers having an overt correlate. For instance, consider the following:

(36) a. When clients tell me that [they want to be fit], I ask what for? (COCA 2000 MAG)
b. He knew where [she was sleeping], and who with? (COCA 2005 ACAD)

The antecedent clause includes no overt correlate like *for something* or *with someone*. The correlate is provided implicitly in the context. However, as noted in the previous literature, the corpus also yields Swiping examples with an overt correlate:

(37) a. "[I want to talk to you about something]." "Ya?" The summer sunlight beat down on them. She shaded her eyes with her hand as she regarded her brother-in-law. "What about?" (COCA 2010 FIC)
b. Give me a break! [Everyone makes it from somewhere] – why does it even matter where from? (COCA 2003 NEWS)

In examples like (37a) and (37b), the antecedent clause includes an indefinite NP

(e.g., *something* and *somewhere*) that is linked to the *wh*-expression in Swiping.

Such examples as (36) and (37) have an overt antecedent clause, but they differ in terms of whether the antecedent clause contains an implicit or overt correlate linked to the *wh*-expression. Note that, different from these Swiping examples with an overt linguistic antecedent clause, the identified data also include cases with no overt linguistic antecedent clause.

(38) a. A lot of people know me but they don't know where from. (COCA 2002 NEWS)
b. Agent Cooper launched himself into a taxi, and the driver said, "Where to?" (COCA 2017 FIC)

In (38a), the Swiping example is interpreted as *where I am from* but the antecedent clause has no overt linguistic material that corresponds to the unexpressed part. The Swiping example in (38b) is typically uttered by a taxi driver to a customer with no preceding linguistic context at all, to mean something like *where do you want me to drive you to?*. Such examples imply that having an overt linguistic antecedent is not a requirement for Swiping: its antecedent can be pragmatically controlled. Our findings show that about 93% of the identified Swiping examples from COCA (875 tokens) have a linguistic antecedent, including 6 merger type examples and the remaining 7% (66 tokens) have a pragmatically controlled antecedent. The frequencies of the three groups depending on the antecedent type are given in Figure 1:

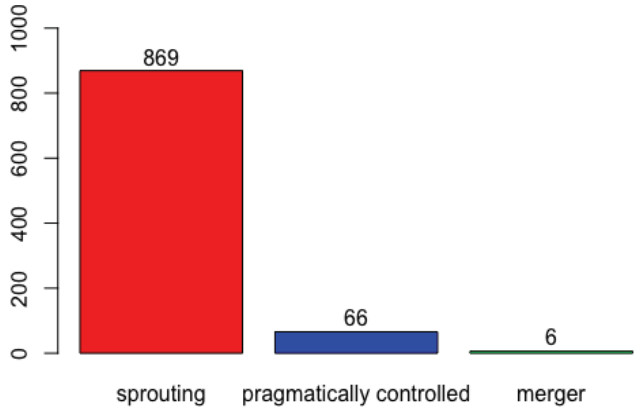


Figure 1. Frequencies of Swiping Examples by the Antecedent Types

As given in Figure 1, the sprouting type (with no overt correlate) is the most dominant one and the merger type is the least preferred one used in Swiping, confirming the observation in previous literature. However, there are also a certain number of cases with no overt linguistic antecedent at all.

Moreover, out of the sprouting and merger Swiping examples (875 tokens), 335 have a complete syntactic identity as in (39) while 539 involve some kind of change in the unexpressed material compared to the antecedent as in (40):

(39) a. When clients tell me that [they want to be fit], I ask what for? (COCA 2000 MAG)
b. He knew where [she was sleeping], and who with? (COCA, 2005, ACAD)

(40) a. "Would you mind sitting over there?" (He points to a table with several other businessmen.) "What for?" (COCA 1996 FIC)
b. "Can I talk to you?" "What about?" (COCA 2012 FIC)
c. "First year of college?'" Freddy smiled. "That's good." "Yes." "Where at? Up here?... "(COCA 1996 FIC)

In (39), the unexpressed part has a strict syntactic identity relation with the material in the antecedent clause marked by the brackets. On the other hand, in each of the examples in (40), the antecedent clause contains some material for the retrieval of the unexpressed part but only some kind of partial syntactic identity relation is satisfied between them. For instance, in (40a), the Swiping example can be understood as *What should I sit over there for?* with a different verb form and a different pronoun from the ones in the antecedent clause. In (40b), it is construed as *What do you want to talk to me about?* with a different pronoun form and with no auxiliary verb *can* in the antecedent clause. Meanwhile, in (40c), the Swiping example has no sentence-level antecedent; rather, the antecedent is just an NP fragment *First year of college?*.

All these findings then imply that we cannot solely resort to the linguistic antecedent for the resolution of the unexpressed part in Swiping; instead, we need to refer to contextual/discourse information.

5. An Analysis: A Direct Interpretation Approach

5.1. An Implication of the Attested Data and Two Main Strands

In accounting for ellipsis phenomena in general, there have been two main strands: the movement and PF-deletion approach and the direct interpretation (DI) approach. The movement and PF-deletion approach basically assumes that the fragment is a typical utterance of the type S (see, among others, Ross 1969, Merchant 2001, 2002, 2004, Hartman and Ai 2009, Radford and Iwasaki 2015). Within this type of movement and PF-deletion approach, an ellipsis site has internally structured material through derivational processes and PF-deletion renders some of it unpronounced under some kind of identity, and the meaning composition depends on the derivational source. Under the movement and PF-deletion approach, as we have seen in Section 3, Swiping thus has full-fledged sentential structure which is 'unpronounced' or 'deleted' and Swiping is derived by applications of movement operations and deletion processes. We have already discussed two different types of movement and PF-deletion analyses of Swiping (i.e., PF head movement analysis and subextraction analysis) and their nontrivial problems in Section 3.

On the other hand, the DI approach for ellipsis, which we adopt in this paper, posits no clausal source structure and within this DI view, the acceptable combinations of a *wh*-expression and a preposition in Swiping must be learned pretty much one-by-one (Culicover 1999, Culicover and Jackendoff 2005).[4] The corpus data we have discussed earlier seem to support this direction. The attested data indicate the peculiarities of Swiping: it is not applicable to all the possible combinations of a *wh*-word and a preposition. If Swiping is derived from pied-piping clausal sources or pied-piping Sluicing, we might expect similar patterns. However, as observed from the data, the uses of Swiping are quite limited. This implies that the learner acquires the possible forms of Swiping directly, without reconstructing rather complex derivations from a regular sentence as an underlying structure (Culicover 1999, Culicover and Jackendoff 2005). To be more specific, this view gains plausibility from the fact that only a limited set of *wh*-expression and a preposition is possible and it is not always possible to have a determined source sentence from a linguistic antecedent. This in turn means

[4] This does not mean that all Swiping constructions are in the lexicon. As an anonymous reviewer points out, there are certain regular properties of the construction that are combined in syntax. See Section 5.3 for the direction to addressing the shared properties of the participating prepositions in the construction.

that it is better to adopt a usage-based (or frequency-based) learning or such semi-productive constructions as Swiping to optimize the process of learning. This eventually supports the postulation of the Swiping Construction in the grammar of English in line with the usage-based theory of learning (Tomasello 2003). In what follows, we sketch a DI analysis of Swiping, making use of discourse information, without resort to underlying syntactic structure and complex derivational processes.

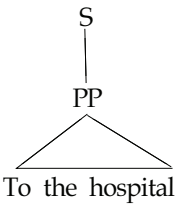
5.2. A Direct Interpretation Approach

Departing from the deletion-based approaches that, as we have seen in the previous section, posit underlying clausal sources for the Swiping examples, the direct interpretation (DI) approach generates the meanings of the unpronounced material without the postulation of underlying syntactic structures (see, among others, Ginzburg and Sag 2000, Culicover and Jackendoff 2005, Sag and Nykiel 2011, Nykiel 2013, Kim 2015a, Jacobson 2016, Kim and Abeillé 2019). Within the DI approach, there is no syntactic structure at the ellipsis site and fragments are simply the sole daughter of an S-node, directly generated from the Head-Fragment Construction defined below (Ginzburg and Sag 2000, Kim 2015a, Kim and Michaelis 2020):

(41) Head-Fragment Construction:
Any category can be projected into a NSU (non-sentential utterance) when it functions as a salient utterance (SAL-UTT).

The construction thus allows any maximal projection (functioning as a salient utterance) to serve as a NSU (non-sentential utterance) with no reference to ellipsis. This simple syntax does not posit any syntactic structure at the ellipsis site of fragments, following the philosophy of Simpler Syntax Hypothesis (Culicover and Jackendoff 2005, Ginzburg and Sag 2000, Kim and Michaelis 2020). The fragment itself is the sole daughter of an S-node. For instance, the fragment answer *To the hospital* for a *wh*-question like *Where are you going?* would have a simple structure like the following:

(42)



The meaning of the NSU is resolved by discourse-based machinery. That is, the interpretation of a fragment is dependent upon the notion of 'question-under-discussion' (QUD) in the dialogue. Dialogues are described by virtue of a Dialogue Game Board (DGB), where the contextual parameters are included and where information about who said what to whom and what/who they were referring to is recorded (see Ginzburg 2012). DGB monitors which questions are under discussion, what answers have been provided by whom, etc. The conversational events are tracked by a variety of conversational 'moves' that have specific preconditions and effects. The main tenet is that non-sentential utterances, functioning as salient utterances, are resolved, making use of the contextual parameters in the DGB. Since the value of QUD is constantly updated as the dialogue proceeds, the relevant context provides a basis for the appropriate interpretation of fragments. In this discourse-based system, DGB is part of the contextual information and contains at least the two attributes, SAL-UTT (salient-utterance) and MAX-QUD (maximal-question-under-discussion), as given in (43).

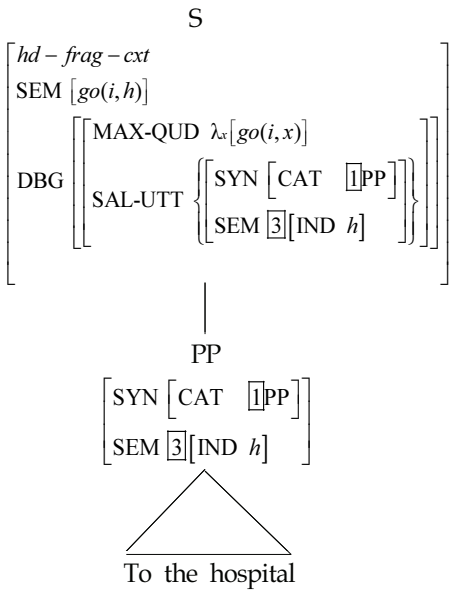
(43) $\left[\text{DGB}\left[\begin{array}{l}\text{SAL-UTT ...}\\ \text{MAX-QUD ...}\end{array}\right]\right]$

The feature MAX-QUD takes questions as its value and represents the question currently under discussion. Meanwhile, SAL-UTT takes syntactic as well as semantic information as its value and represents the utterance which receives the widest scope within MAX-QUD. For example, uttering the question *where are you going?* will activate the feature structure with the appropriate DGB information, as in (44):

(44)
$$\begin{bmatrix} \text{FORM} & \langle \text{Where are you going?} \rangle \\ \text{SYN} & \text{S} \\ \text{SEM} & \lambda_x[go(i,x)] \\ \text{DGB} & \begin{bmatrix} \text{MAX-QUD} & \lambda_x[go(i,x)] \\ \text{SAL-UTT} & \begin{bmatrix} \text{SYN|CAT} & \text{PP} \\ \text{SEM} & x \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

The *wh*-question thus asks where the addressee is going (QUD) and this information linked to the *wh*-phrase (the index value) functions as the SAL-UTT. The fragment answer *To the hospital* then provides its value (Ginzburg and Sag 2000, Kim 2015a,b). Since the fragment answer functions as a salient utterance, it can be projected into a head-fragment construct together with the relevant dialogue information, as represented in the following:[5]

(45)



[5] In a construction-based HPSG framework we adopt here, boxed tags indicate identities of feature values and they are used to reduce redundancy in feature structure specifications (Pollard and Sag 1994, Sag et al. 2003, Sag 2012, Kim 2016, Kim and Michaelis 2020). For instance, in (45), the boxed tag 1 ensures that the syntactic category of the PP *To the hospital* and that of the SAL-UTT in the DGB are identical.

The fragment answer is a well-formed stand-alone clause licensed by the Head-Fragment Construction that requires the CAT value of the fragment to be matched to that of the SAL-UTT. As noted, this fragment is preceded by the question *Where are you going?*, which introduces a QUD questioning a value for where the addressee is going (λ_x[go(i,x)]). The fragment *To the hospital*, functioning as a salient utterance, then provides a value for this variable. This resolution process is equivalent to the view that the meaning of a question is a function that yields a proposition when applied to the meaning of the answer, as given in the following (Krifka 2001b, Ginzburg and Sag 2000, Jacobson 2016):[6]

(46) a. Meaning of the Q: $\lambda_x[go(i,x)]$
b. Meaning of the fragment: h
c. Question applied to the answer: $\lambda_x[go(i,x)](h) = [go(i,h)]$

The fragment answer is properly resolved to yield a propositional meaning. The analysis thus projects a sentential utterance from a fragment, introducing neither clausal sources nor movement operations. The propositional content of the fragment is retrieved by combining the content of the fragment with an abstract derived from a proposition salient in the context.

5.3. Swiping Construction

As noted earlier, the semi-productivity of Swiping in English implies that it is more plausible to assume that the learner acquires the possible forms of Swiping directly, without reconstructing a derivation from a regular sentential underlying structure (Culicover and Jackendoff 2005). We have seen that only a limited set of combinations is possible, and further observed that it is not always possible to have a determined source sentence. For this, we suggest that English introduces the Swiping Construction, as a subtype of the Head-Fragment Construction, as specified in the following:

[6] This 'structured meaning' approach differs from the 'propositional set' approach where the meaning of questions denotes sets of propositions (Hamblin 1973, Karttunen 1977, Groenendijk and Stokhof 1984). See Krifka (2001b) for the comparison of these two approaches.

(47) Swiping Construction in English (↑ *sluice-int-cl*)

$$\left[\begin{array}{l}\text{SYN}\ \ \text{S}\\ \text{SEM}\ \ \lambda_{x}\text{Q}(x)\\ \text{SAL-UTT}\ \left\{\left[\begin{array}{l}\text{SYN}\ \left[\text{CAT}\ \ \boxed{1}\right]\\ \text{SEM}\ \left[\text{IND}\ \ i\right]\end{array}\right]\right\}\end{array}\right] \rightarrow \left[\begin{array}{l}\text{SYN}\ \left[\begin{array}{l}\text{CAT}\ \ \text{N(P)}\\ \text{WH}\ \ +\end{array}\right]\\ \text{SEM}\ \left[\text{IND}\ \ x\right]\end{array}\right], \left[\begin{array}{l}\text{SYN}\ \left[\text{CAT}\ \ \boxed{1}\text{P}[str]\right]\\ \text{SEM}\ \left[\text{IND}\ \ i\right]\end{array}\right]$$

The construction specifies that in English the combination of a *wh*-expression with a preposition can project into a sentential utterance with a special mapping relation between form and function. The construction is a subtype of *slu-int-cl* (sluice-interrogative-clause), which is a subtype of *hd-frag-cx* (head-fragment-cx) (Ginzburg and Sag 2000).[7] This means that Swiping is a subtype of Sluicing: as noted earlier, Swiping occurs only in Sluicing environments, whose data are repeated here:

(48) a. I got a date. Who with?
b. *Who with do you have a date?

The constructional constraint in (47) specifies that Swiping is a NSU projected from the combination of a *wh*-expression and a focused preposition. This NSU then would not be able to combine with other sentential expressions as in (48b).

This construction is also unique in the sense that the preposition serves as the salient utterance (SAL-UTT) in the discourse (focus establishing constituent) and belongs to the type of strandable (*str*). Prepositions that cannot be stranded do not appear in the Swiping construction. Prepositions like *during* and complex prepositions are non-strandable:

(49) a. *Which vacation did Kim go to Seoul during ____ .
b. *What did he eat salad without ____ ?

We can observe that such non-strandable complex prepositions do not occur in Swiping (Merchant 2002, Culicover and Jackendoff 2005, Radford and Iwasaki 2015:(26)):

[7] The category of the *wh*-expression is specified to be an N(P). As for cases like *where to* or *where for*, we take *where* as a nominal expression referring to a location.

(50) a. I know they fell out, but I don't know what over/*what because of.
b. I heard some banging too. Where? I couldn't tell you where (*straight) from.

Further, in Swiping, only the preposition can be given stress (Rosen 1976, Merchant 2002, Hartman and Ai 2009, Radford and Iwasaki 2015).

(51) a. John is going to the prom, but I am not sure who WITH/*WHO with.
b. Mary's got flowers in the mail. Guess who FROM/*WHO from.

The construction thus ensures that in Swiping, only a restricted set of *wh*-expressions (lexical as well as phrasal) can combine with a limited set of prepositions that can bear focus (or function as a salient utterance).

The construction is also idiosyncratic in the meaning composition. That is, it is the focused preposition that serves as the syntactic head of the construction, but it is the *wh*-expression that functions as the semantic head, as seen from the mother's semantics. Put it differently, the NSU Swiping is basically asking a type of *wh*-question with the preposition as a focused expression. For instance, in (51a), the antecedent clause evokes a QUD about with whom (x) John is going to the prom, as given in the MAX-QUD value (see below too). The Swiping here *Who with?* places a focus value on the preposition *with*, different from a Sluicing one like *I don't know with whom*.

As noted earlier and seen in examples like (48a) and (51a), the antecedent clause of Swiping typically does not include a correlate linked to the *wh*-expression. The *wh*-expression is just linked to an implicit correlate. How then can we evoke this implicit correlate in the DGB? As an illustration, consider the partial structure of (48a). Uttering the antecedent clause *I got a date* can even evoke a QUD asking whom the speaker got a date with. The discourse would then update the uninstantiated PP argument in the DGB information, as shown in (52):[8]

---

[8] Null arguments have two different types: definite null instantiation (DNI, *dni*) and indefinite null instantiation (INI, *ini*) (Johnson and Fillmore 2000, Lyngfelt 2012, Ruppenhofer and Michaelis 2014, Kim 2015b). Consider the following examples.

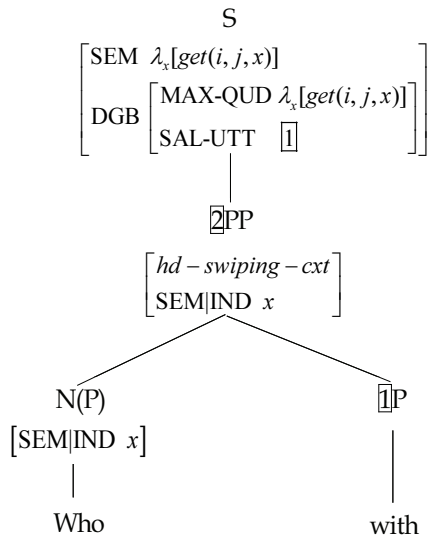
(i) a. We arrive at 8 pm.
b. No doubt, mistakes were made.

In (ia), the missing goal argument of *arrived* is an entity that must be accessible to the interlocutors

(52)
$$\left[\begin{array}{l}\text{DGB}\left[\begin{array}{l}\text{SAL-UTT}\left[\begin{array}{l}\text{SYN PP}\left[\begin{array}{l}\textit{ini}\\ \text{PFORM } \textit{with}\end{array}\right]\\ \text{SEM someone}^{x}\end{array}\right]\\ \text{MAX-QUD } \lambda_x[get(i,j,x)]\end{array}\right]\end{array}\right]$$

The PP argument is linked to the NSU *Who with?* and this NSU is asking a value for this variable (*x*). The SAL-UTT information linked to the indefinite null instantiation (INI) is introduced by context, entering into the QUD. The *wh*-word *who* combines with the following preposition *with* as a well-formed instance of the Swiping Construction. This PP is projected into an S on its own with the intended interpretation as a type of the Head-Fragment Construction:

(53)



The present analysis thus allows the context to provide a proper correlate. This enables us to account for cases where the Swiping example does not have an overt linguistic antecedent at all but its antecedent is just pragmatically

(i.e., speaker and hearer) from the linguistic and physical discourse context. This way, the omission of the goal argument here is an instance of DNI. On the other hand, in (ib), the agent making the mistake need not be mutually known to the interlocutors. In this regard, the omission of the agent argument in the passive construction in (ib) is an instance of INI. See Ruppenhofer and Michaelis (2014) and Kim (2015b) for more details of DNI and INI.

controlled. For instance, the Swiping example in (38b), repeated in (54), can have a MAX-QUD, as given in (55):

(54) Context: Agent Cooper launched himself into a taxi, and the driver said: Where to?

There is no linguistic antecedent that this Swiping can refer to. The QUD is evoked only by the context:

(55) QUD: $\lambda_x[go(i,x)]$

The context is updated that the Agent Cooper is going to some place, and this evokes a QUD asking a value for the variable *some place*. This Swiping makes the direction value *to* as the focus value. Such an instance does not have a clear sentential source that we can reanalyze. The discourse-based analysis put forward here thus could also avoid pitfalls that any analysis resorting to strict syntactic identity between the antecedent clause and the unexpressed part faces.[9]

6. Conclusion

Swiping is a type of elliptical construction where the mapping relation between form and function (meaning) is atypical. In this paper, we first reviewed some key properties of the construction that previous literature has noted and we saw that previous literature has made different claims in some respects such as the acceptable *wh*-expression and preposition combinations and the possible antecedent type. We also reviewed two different types of movement + deletion analyses (i.e., PF head movement analysis and subextraction analysis) and discussed the pitfalls they face in accounting for the grammatical properties.

To understand the uses of the construction better, we have performed a corpus investigation. The corpus data revealed diverse intriguing uses of the

[9] There are two facts that the paper has not discussed. The first issue is how Swiping examples including an intervening expression between the *wh*-expression and the preposition can be licensed. As discussed in (8), the intervening expression is typically a parenthetical one. Such examples could be licensed if we allow a parenthetical expression to intervene between a head and its complement as in *It is, of course, necessary to proofread the paper*. The second one concerns merger Swiping examples that include a correlate in the antecedent clause, as in (15). Such examples are in general disfavored, but the context may accept where the correlate is not salient enough.

construction in terms of distribution by *wh*-expressions, participating prepositions, possible combinations of the two, matrix/embedded environments, and antecedent/correlate types. In particular, we observed that Swiping has a family of constructions like Sluicing and it is also related to P-stranding and pied-piping and that Swiping and pied-piping Sluicing are not in necessary and sufficient conditions. This provided us a justification that English independently employs the Swiping Construction in line with the usage-based theory of learning. The data support a usage-based Construction Grammar approach for such semi-productive constructions to optimize the process of learning. We also noted that the licensing of Swiping depends on the tight interplay of the rather idiosyncratic *wh*-expression and preposition combination patterns and discourse information. We then showed that the direct interpretation (DI) approach, couched upon a construction-based perspective, is a feasible alternative to license Swiping in English, making use of enriched discourse information as well as syntactic and semantic information, with no postulation of additional syntax for the unexpressed material and complex derivational processes.[10]

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[10] As an anonymous reviewer points out, one may try to capture the grammatical properties of Swiping within semantic/discourse-based frameworks like Alternative Semantics (Rooth 1992, Büring 2007) and Structured Meaning Theory (von Stechow 1981, Krifka 2001a,b). We leave this possibility open.

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