

# Swiping in Child English

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## 1. Introduction

It has been observed at least since Ross (1969) and Rosen (1976) that English allows a peculiar type of elliptical *wh*-questions that can be found only under sluicing, in which the *wh*-object of the preposition appears not after the preposition but before it, as illustrated in (1). Merchant (2002) calls this construction *Swiping* (sluiced *wh*-word inversion with prepositions in Northern Germanic).

- (1) a. John fixed it, but I don't remember what with.  
b. John was talking, but I don't remember who to.

Since the recent minimalist analysis by Merchant (2002), this phenomenon has gained much attention, and two major types of analysis have been proposed in the syntactic literature. One approach (Merchant 2002) argues that swiping crucially involves pied-piping of prepositions (P-pied-piping) in its derivation, while the other approach (Hasegawa 2007; Kim 1997; Nakao and Yoshida 2006) claims that swiping is derived through preposition-stranding (P-stranding). In light of this background, this study attempts to shed new light on the syntax of this construction, by bringing data from a novel source. More specifically, the present study evaluates these two types of syntactic analysis based on the data from child English. Our findings, even though preliminary, suggest that the P-stranding approach is more consistent with the time course of the acquisition of English, and cast doubt on the proposal that P-pied-piping plays a crucial role in the derivation of Swiping sentences.

## 2. Two Major Approaches to Swiping

Swiping has a few fundamental characteristics that any theory of this phenomenon should account for. One of these properties is that, at least in English, only a limited variety of *wh*-expressions can occur in this construction. Based on his classification of *wh*-elements in swiping sentences given in (2), Merchant (2002:297) proposes the generalization in (4) that the *wh*-element must be a head, not a phrase.<sup>1</sup>

- (2) Possible and impossible *wh*-elements in swiping:  
a. Swiping possible: who, what, when, where  
b. Swiping impossible: which, which one, whose, how rich, what kind, what time, etc.

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1. The *wh*-expressions *which* and *whose* in (2b) are monomorphemic, as well as those in (2a). Yet, Merchant (2002) argues that *which* must select a complement (which may be null due to NP-ellipsis), and *whose* can be analyzed as *who* in the specifier of DP headed by the genitive 's. These properties distinguish them from other simple *wh*-expressions listed in (2a).

- (3) a. \*She bought a robe for one of her nephews, but God knows which (one) for.  
 b. \*They were riding in somebody's car, but I don't know whose in.

(4) The Minimality Condition: Only 'minimal' (i.e.  $X^0$ ) *wh*-operators occur in swiping.

Another basic property of swiping is that such inversion of a preposition and its argument occurs only in sluicing: For example, neither nonelliptical questions nor VP-ellipsis can co-occur with swiping, as exemplified in (5). Given this limitation, Merchant (2002:298) establishes the generalization in (6).

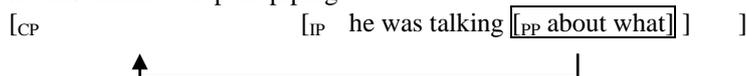
- (5) a. \*I don't know [who to] Lois was talking.  
 b. \*We know when she spoke, but we don't know [what about] she did.

(6) The Sluicing Condition: Swiping occurs only under sluicing.

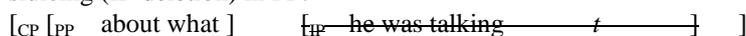
In order to account for these two fundamental properties of swiping, Merchant (2002) proposed an analysis in which swiping sentences are derived through *wh*-movement involving pied-piping of a preposition, followed by head movement of the *wh*-word to the selecting preposition.<sup>2</sup> Merchant argues that this head movement of the *wh*-element occurs at PF, after Spell-Out and after the application of the deletion operation. A sample derivation under this analysis is shown in (7).

(7) (John was talking, but I don't remember ...)

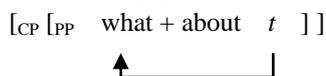
a. *wh*-movement + P-pied-piping:



b. sluicing (IP-deletion) in PF:



c. head movement in PF:



This "P-pied-piping + PF head-movement" analysis provides a straightforward account for the Minimality Condition: In order to adjoin to the preposition, which is a head, the *wh*-element must also be a head, due to Structure Preservation. In other words, by using head movement to derive the observed inversion, this analysis correctly rules out the possibility that phrasal *wh*-operators participate in swiping. Furthermore, by locating this head movement in the PF component, we can make its application sensitive to whether IP has undergone the deletion operation in PF. Namely, under Merchant's analysis, the Sluicing Condition reduces to the sensitivity of the relevant head-movement to IP-deletion in PF.

Even though the analysis by Merchant (2002) captures the two conditions in (4) and (6) in a straightforward way, it offers no account of the cross-linguistic distribution of swiping that Merchant himself notes: The languages that allow swiping are limited to those that permit P-stranding. English, Danish, and some varieties of Norwegian allow swiping, and these languages also permit P-stranding, as illustrated in (8) and (9). This observation suggests that the availability of P-stranding constitutes a necessary condition for the possibility of swiping.<sup>3</sup> Yet, as we have seen above, what is crucially involved in Merchant's analysis is P-pied-piping, not P-stranding. Then, under this approach, it remains mysterious why P-stranding seems relevant in determining the distribution of swiping across languages.

2. See van Craenenbroeck (2004) for a related proposal.

3. It is not a sufficient condition, though. Languages like Frisian, Icelandic, and Swedish rule out swiping, even though they permit P-stranding.

- (8) Danish:
- a. Per er gået i biografen, men jeg ved ikke hvem med.  
 Per is gone to cinema but I know not who with  
 ‘Per went to the movies but I don’t know who with.’
- b. Hvem har Peter snakket med?  
 who has Peter talked with  
 ‘Who was Peter talking with?’

- (9) Norwegian:
- a.% Per gikk på kino, men jeg veit ikke hvem med.  
 Per went to cinema but I know not who with  
 ‘Per went to the movies but I don’t know who with.’
- b. Hvem har Per snakket med?  
 who has Per talked with  
 ‘Who was Per talking with?’
- (Merchant 2002: 291, 309)

Capitalizing on this cross-linguistic generalization, Hasegawa (2007) and Nakano and Yoshida (2006) proposed an analysis of swiping in which P-stranding plays a central role.<sup>4</sup> More specifically, they argue that the swiping construction is derived through the combination of P-stranding and a rightward movement of PP. A sample derivation under Hasegawa’s (2007) analysis is shown in (10).<sup>5</sup>

- (10) (John was talking, but I don’t remember ...)
- a. *wh*-movement + P-stranding:  
 [CP [IP he was talking [PP about what] ] ]
- ↑—————↓
- b. rightward movement of PP:  
 [CP what [IP he was talking [PP about t] ] ]
- ↑
- c. sluicing (IP-deletion) in PF:  
 [CP what [~~IP he was talking t~~] [PP about t ] ]

Such a “P-stranding + PP movement” analysis is quite appealing in that it opens up a way to capture the cross-linguistic generalization that swiping is restricted to P-stranding languages. Furthermore, under this analysis, it is not necessary to postulate the condition in (6) that the swiping sentences involve obligatory IP-deletion: Even without the application of sluicing, we would obtain a well-formed sentence, as we can see in (10c). On the other hand, this approach has difficulty in offering a satisfactory account of the Minimality Condition: There is no reason not to expect both phrasal and minimal *wh*-expressions to appear in the swiping construction, given that both of them can undergo P-stranding.

- (11) a. What was John talking about?  
 b. Which (book) was John talking about?

In sum, both the “P-pied-piping + PF head-movement” analysis and the “P-stranding + PP movement” analysis have their own strengths and weaknesses, and the evaluation of these two approaches awaits evidence from a different source. In light of this situation, we now turn to a novel source of evidence: the time course of child language acquisition.

4. See also Kim (1997) and Richards (2001).

5. A crucial difference between Hasegawa’s (2007) analysis and that of Nakao and Yoshida (2006) is that the latter analysis places the PP movement before the P-stranding movement. Since this difference does not affect the discussion to follow, I will refrain from further discussion.

### 3. Predictions for the Acquisition of English

The P-pied-piping approach of Merchant (2002) and the P-stranding approach of Hasegawa (2007) and Nakao and Yoshida (2006) make different predictions for the acquisition of English. The former approach gives *wh*-movement involving P-pied-piping a central role in the derivation of swiping. Under this analysis, the syntactic knowledge required for P-pied-piping constitutes a proper subset of the syntactic knowledge required for swiping. Then, we expect that English-learning children should never acquire swiping significantly earlier than P-pied-piping with *wh*-movement. In other words, the P-pied-piping approach predicts that (12) should hold in the acquisition of English. In contrast, under the P-stranding approach, *wh*-movement involving P-stranding constitutes a crucial step in deriving swiping sentences, and the syntactic knowledge required for P-stranding constitutes a proper subset of the syntactic knowledge required for swiping. Then, we predict that English-learning children should never acquire swiping significantly earlier than P-stranding with *wh*-movement, as stated in (13).

**(12) Prediction for the Acquisition of English from the P-pied-piping Approach:**

English-learning children should acquire P-pied-piping with *wh*-movement significantly earlier than or at around the same time as swiping.

**(13) Prediction for the Acquisition of English from the P-stranding Approach:**

English-learning children should acquire P-stranding with *wh*-movement significantly earlier than or at around the same time as swiping.

### 4. Transcript Analysis

In order to determine which of the two acquisitional predictions is correct, I analyzed 20 longitudinal corpora for English from the CHILDES database (MacWhinney 2000), which provide a total sample of more than 434,000 lines of child speech. For each child, we located the first clear uses of (i) swiping, (ii) *wh*-movement involving P-pied-piping, and (iii) *wh*-movement involving P-stranding. The corpora I analyzed are summarized in Table 1. The CLAN program Combo was used, together with complete files of prepositions and *wh*-words in English, to identify potentially relevant child utterances. These were then searched by hand and checked against the original transcripts to exclude imitations, repetitions, and formulaic routines. The age of acquisition was taken as the first clear use, followed soon after by repeated use (Stromswold 1996, Snyder 2007).

The results were as follows. Two children (Abe and Aran) showed frequent use of swiping, while other children did not produce any swiping sentences. One of these two children (Abe), however, uttered only a single type of swiping: *What for?* This limitation leaves the possibility that this expression is a formulaic routine for this child. Hence, I now focus on the analysis of the remaining single child, Aran.

Aran exhibited the first clear use of swiping at the age of 2;07 (years;months). His swiping sentences exhibited two kinds of *wh*-expressions (*who* and *what*) and various different prepositions. This variety suggests that Aran had already acquired adult-like knowledge of swiping. Some actual utterances are listed in (14).

- (14) a. \*CHI: what in ? (Aran26a.cha)  
b. \*CHI: who for ? (Aran27a.cha)  
c. \*CHI: who from ? (Aran28b.cha)  
d. \*CHI: what with ? (Aran33a.cha)

Despite such productive use of swiping, Aran showed not a single use of P-pied-piping with *wh*-movement. This complete absence of P-pied-piping in the spontaneous speech makes it difficult to statistically evaluate the prediction in (12). Yet, the lack of P-pied-piping in child English despite the presence of swiping casts serious doubt on any analysis in which swiping is derived through *wh*-movement involving P-pied-piping.

Child	Collected by	Age Span	# Child Utterances
Abe	Kuczaj (1976)	2;04 – 5;00	22,633
Adam	Brown (1973)	2;03 – 4;10	45,555
Anne	Theakston et al. (2001)	1;10 – 2;09	19,902
Aran	Theakston et al. (2001)	1;11 – 2;10	17,193
Becky	Theakston et al. (2001)	2;00 – 2;11	23,339
Carl	Theakston et al. (2001)	1;08 – 2;08	25,084
Dominic	Theakston et al. (2001)	1;10 – 2;10	21,180
Eve	Brown (1973)	1;06 – 2;03	11,563
Gail	Theakston et al. (2001)	1;11 – 2;11	16,973
Joel	Theakston et al. (2001)	1;11 – 2;10	17,916
John	Theakston et al. (2001)	1;11 – 2;10	13,390
Liz	Theakston et al. (2001)	1;11 – 2;10	16,569
Naomi	Sachs (1973)	1;02 – 4;09	15,960
Nicole	Theakston et al. (2001)	2;00 – 3;00	16,950
Nina	Suppes (1973)	1;11 – 3;03	31,505
Peter	Bloom (1970)	1;09 – 3;01	26,891
Ruth	Theakston et al. (2001)	1;11 – 2;11	20,419
Sarah	Brown (1973)	2;03 – 5;01	37,012
Shem	Clark (1978)	2;02 – 3;02	17,507
Warren	Theakston et al. (2001)	1;10 – 2;09	16,651

Table 1: Corpora Analyzed

In contrast, P-stranding under *wh*-movement was frequently observed in Aran's speech. The first clear use of P-stranding appeared at the age of 2;05, two months earlier than the first clear use of swiping. In order to evaluate the statistical significance of the observed age-differences between acquisition of P-stranding and acquisition of swiping, I counted the number of clear uses of the earlier construction before the first clear use of the later construction. I next calculated the relative frequency of the two constructions in the child's own speech, starting with the transcript after the first use of the later construction, and continuing through the end of the corpus. A Binomial Test was then used to obtain the probability of sampling the observed number of tokens of the earlier construction simply by chance, before the first use of the later construction, under the null hypothesis that both became available concurrently and had the same relative probability of use as in later transcripts (Stromswold 1996, Snyder 2007).

This statistical analysis revealed that Aran acquired P-stranding significantly earlier than swiping ( $p < .0001$ ), along the lines of the prediction in (13). This finding, combined with the complete lack of P-pied-piping, lends support to the P-stranding approach to swiping, and puts further explanatory burden on the P-pied-piping analysis.

## 5. Conclusion

Even though the results are preliminary in that the crucial data comes from a single child, these findings suggest that the time course of the acquisition of English is more consistent with the P-stranding analysis of swiping (Hasegawa 2007; Nakao and Yoshida 2006), and poses a new problem for the P-pied-piping analysis (Merchant 2002). A broader implication of this study is that the time course of child language acquisition is potentially an important testing ground for evaluating competing syntactic analyses.

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