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# **Do Parameters Have Default Values? Evidence from the Acquisition of English and Spanish**

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## **1. Introduction**

The Principles-and-Parameters approach (Chomsky 1981) postulates that the innate biological basis of human language (the initial state or UG) consists in a set of universal principles and a finite collection of parameters. Each parameter has a few values that determine possible language variation, and the task for a child is to identify the correct settings for the community's language.

According to Chomsky (2001:1), all parameters of UG are specified for certain settings prior to any linguistic experience. Namely, every parameter of UG has a *default setting*.

- (1) *Default Settings, Hypothesis I* (Chomsky 2001:1):  
At  $S_0$  [initial state], all parameters are set with unmarked values.

This is not the only possible situation, however. It might be the case that some of the parameters have a default specification while others do not, as stated in (2).

- (2) *Default Settings, Hypothesis II*:  
Not every parameter has a default setting.

Fodor (1998:26) explicitly points out this possibility: “There are several possibilities. One is that some or all parameters are in a specific ‘unset’ state prior to unambiguous triggering.”<sup>1</sup> Given this competing view, an important question arises as to whether the stronger position adopted by Chomsky can be maintained, which awaits an empirical answer.

In this study, we evaluate the two competing views on the default settings given in (1) and (2) with data from child language acquisition. We argue that the acquisition of preposition stranding (P-stranding) in English and of pied-piping in Spanish provides an empirical argument that not every parameter has a default specification, contrary to Chomsky’s assumption.<sup>2</sup>

## **2. Default Values of Parameters: Evidence from Acquisition**

In this section, we briefly review two pieces of evidence provided in the acquisition literature for the default values of parameters.

The first piece of evidence comes from the seminal study of early null subjects by Hyams (1986). It has been reported at least since the 1970’s that child English (around the age of two) permits both overt and null subjects (Bloom, Lightbown and Hood 1975). In addition, overt expletives are reportedly absent during this stage. These characteristics are shared by adult Italian and Spanish, as exemplified in (4).

### (3) Child English:

- a. \_\_\_ want more apples. / I want doggie.
- b. Yes, \_\_\_ is toys in there. ‘Yes there are toys in there.’

### (4) Italian (Hyams 1986:30-31, 70)

- a. Mangia una mela. ‘Eats an apple.’  
Gianni mangia una mela. ‘Gianni eats an apple.’

- b. Piove oggi. 'Rains today.'

Hyams explained this observation in the following way. UG is equipped with a parameter that divides languages into two major types, null-subject languages like Italian/Spanish, and non-null-subject languages like English, and the value that corresponds to the former is specified as the default. As a consequence, child English exhibits the properties of adult Italian/Spanish.<sup>3</sup>

The second argument for default settings is presented in the study of children's *wh*-questions by McDaniel, Chiu & Maxfield (1995). Their study is based on the observation originally reported in de Villiers, Roeper & Vainikka (1990) and Thornton (1990) that English-learning children (around the age of three to five years) sometimes produce *wh*-questions as in (5) in experimental situations. According to McDaniel et al., such '*wh*-copying' constructions are also observed in some dialects of adult German and Romani, as illustrated in (6).

- (5) Child English (Thornton 1990:87):  
What do you think what Cookie Monster eats?

- (6) Romani (McDaniel et al. 1995:712):  
Kas mislin-e kas o  
 who-ACC think-2SG/PRES who-ACC the-NOM/MASC/SG  
 Demir-i dikh-ol?  
 Demir-NOM see-3SG/PRES  
 'Who do you think that Demir sees?'

Given the similarity between (5) and (6), McDaniel et al. (1995) proposed that there is a parameter determining availability of the *wh*-copying construction, and that the value that permits this construction is specified as the default setting. Hence, children learning English produce *wh*-questions as in (5) in the course of acquisition.

The two pieces of evidence reviewed above indicate that the default values have the effects summarized in (7).

- (7) The Effects of Default Settings:
- a. For a certain period of development, a child produces forms that are not observed in the target grammar.
  - b. The relevant forms are permitted in other adult grammars.

If the strong hypothesis in (1) is correct, then all parameters should (in principle) exhibit the effects stated in (7).<sup>4</sup> The question is whether this is true. In this study, we address this question by investigating the acquisition of P-stranding. The next section summarizes several proposals concerning the nature of the P-stranding parameter, and determines the major property that is shared by these proposals.

### 3. Parameters of Preposition Stranding: Brief History

#### 3.1. On Certain Differences between English and Spanish

It is well-known that languages differ with respect to the movement possibilities for prepositional complements. For example, in English, the *wh*-movement of a prepositional complement can strand the preposition, while in Romance languages like Spanish, prepositions must be pied-piped along with the *wh*-word.

(8) English: Which subject did they talk about *t* ?

(9) Spanish:

- a. \*Cuál          asunto          hablaban          sobre          *t* ?  
                   which          subject          were-they-talking          about
- b. Sobre          cuál          asunto          hablaban          *t* ?  
                   about          which          subject          were-they-talking

Given this cross-linguistic variation, several attempts have been made to formulate the parameter of P-stranding, some of which are summarized below.<sup>5</sup>

### 3.2. *van Riemsdijk (1978): COMP Position within PP*

One of the earliest works on P-stranding, van Riemsdijk (1978:275), suggested that the possibility of P-stranding (with *wh*-movement) in English results from the availability of the COMP position in PPs (which would correspond to [Spec, PP] in current terms): PPs constitute an island in every language, but in English they can project a COMP position, and as a consequence, *wh*-movement of the prepositional complement can use that position as an ‘escape hatch’, making P-stranding possible. In those languages that do not have this COMP position, the entire PP is moved in order to avoid an island violation. The relevant parameter is stated in (10).

(10) PARAMETER (van Riemsdijk 1978:275):

A language {has, does not have} COMP position within PP.

### 3.3. *Hornstein & Weinberg (1981): Reanalysis*

Hornstein & Weinberg (1981:63) claimed that cross-linguistic variation in P-stranding stems from the availability of a certain syntactic operation, rather than a certain syntactic position. Specifically, they proposed a syntactic rule of *Reanalysis*, which creates a complex verb from a verb and any set of contiguous elements to its right in the domain of VP. For example, this operation creates the structure in (11b) from the one in (11a).<sup>6</sup> The availability of this operation is parameterized, as shown in (12).

- (11) a. John [<sub>VP</sub> [<sub>V</sub> talked] [<sub>PP</sub> about Fred]].  
b. John [<sub>VP</sub> [<sub>V</sub> talked about] Fred].

(12) PARAMETER:

A language {has, does not have} the Reanalysis operation.

According to Hornstein & Weinberg, UG provides a universal filter that rules out traces marked with oblique Case, the Case that is assigned by prepositions. Given this filter, *wh*-movement of prepositional complements is excluded under ordinary circumstances. Yet, in languages like English that have the Reanalysis rule, a verb and a preposition may undergo this operation, and as a result, the NP in the complement of a preposition can be assigned objective Case by the complex verb. Thus, P-stranding does not induce a violation of the relevant UG filter in English. In contrast, languages like Spanish do not have the Reanalysis operation, and thus *wh*-movement of prepositional complements must pied-pipe the preposition in order to avoid violating of the UG filter.

#### 3.4. *Kayne (1981): Government Properties of Prepositions*

Even though the previous two analyses have been quite influential, they share one important conceptual problem: The parameters proposed in their studies are quite ‘small’, in the sense that they are relevant only to the phenomenon of P-stranding. The consideration of learnability requires that the theory of UG should restrict the range of possible adult grammars as narrowly as possible. One obvious way to do this is to reduce the number of parameters, by making each of them responsible for multiple properties. Then, the parameter relevant to P-stranding is also preferred to have more than one consequence for the surface grammar.

Kayne (1981) makes one such attempt.<sup>7</sup> He argues that the possibility of P-stranding is associated with the availability of what we will call the prepositional complementizer (PC) construction, namely an infinitival clause

with an overt subject headed by a (null) prepositional complementizer.

- (13) a. English: John wants [CP (for) [IP Mary to leave]].  
b. Spanish: \* Juan quiere [CP (para) [IP María salir]].

Kayne claims that English prepositions are structural governors, and their government domain extends to the nearest barrier. Prepositions in Romance languages, however, govern only in the sense of subcategorization, and their government domain is restricted to their sister. Given this difference, Case-assignment by the prepositional complementizer to the subject of an infinitival clause is possible in English but not in Spanish, leading to the contrast illustrated in (13). Furthermore, under Kayne's system, even though Reanalysis is available in every language, UG dictates that this rule can apply only when prepositions and verbs govern in the same way. English satisfies this condition, since both prepositions and verbs structurally govern NP. On the other hand, Romance prepositions never meet this condition, because they differ from verbs in that their governing domain extends only to their sister. This way, the contrast between English and Spanish regarding P-stranding also follows from the difference in the government properties of prepositions. The parameter that Kayne proposed is formulated in (14).

- (14) PARAMETER:  
a. P structurally governs NP  
b. P governs NP only in the sense of subcategorization.

### 3.5. *Law (1998): D-incorporation to P*

Even though Kayne's (1981) parametric system is quite attractive, in that it covers not only cross-linguistic variation in P-stranding but also variation in the PC construction, it cannot be maintained in the current Minimalist framework.<sup>8</sup>

Kayne's parameter crucially relies on the notion of *government*, which is abandoned in the present framework due to its lack of conceptual necessity (Chomsky 1995:176). In light of this theoretical development, a minimalist parameter of P-stranding has been proposed by Law (1998), which is given in (15).<sup>9,10</sup>

(15) PARAMETER:

A language {has, does not have} D-to-P incorporation.

If the positive value of the parameter in (15) is taken, as in Spanish, the head of the DP in the complement of P always incorporates into P. This syntactic incorporation is sometimes reflected in morphology as P+D suppletive forms.

(16) P+D suppletive form in Spanish:

Juan habló	<u>del</u>	asunto	más	difícil.
Juan talked	about-the	subject	most	difficult

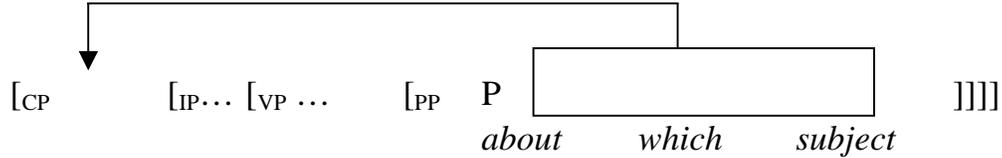
'Juan talked about the most difficult subject.'

Under the assumption that *wh*-words belong to the category D, they always incorporate into the preposition, and hence *wh*-movement to the specifier of CP necessarily results in pied-piping of the preposition. On the other hand, a language like English which takes the negative setting of the parameter has no D-to-P incorporation, and as a consequence, the language has neither P+D suppletive form nor obligatory pied-piping.

(17) a. Languages with the positive setting:



b. Languages with the negative setting:



### 3.6. Major Characteristic of the P-stranding Parameter

Even though the four proposals we have reviewed above significantly differ from each other, they share one important idea: The parameter of P-stranding consists of two values, one leading to the availability of P-stranding and the other leading to obligatory pied-piping.<sup>11</sup> This basic property, combined with the hypothesis in (1), makes a clear acquisitional prediction, which is discussed in the next section.

## 4. Predictions for Acquisition

If the parameter of P-stranding consists of two values, as widely assumed in the syntactic literature, and if the hypothesis in (1) is correct in saying that every parameter has a default setting, then one of the two predictions in (18) should hold with respect to the acquisition of P-stranding and of pied-piping.

(18) a. **Prediction A:**

If the P-stranding value is the default, then children learning either English or Spanish should use P-stranding when they first begin to apply *wh*-movement to prepositional objects.

b. **Prediction B:**

If the pied-piping value is the default, then children learning English should pass through a pied-piping stage before they begin to use P-stranding.

## 5. Evaluating the Predictions: Transcript Analysis

### 5.1. Subjects and Method

In order to evaluate the predictions in (18), we examined spontaneous speech data from children acquiring English or Spanish as their first language. For English, we selected ten longitudinal corpora from the CHILDES database (MacWhinney 2000), to obtain a total sample of more than 124,000 lines of child speech. For each child, we located the first clear uses of (a) a direct-object *wh*-question, and (b) a *wh*-question or null-operator construction involving the complement to a preposition. The English corpora we analyzed are summarized in (19).

(19) English Corpora Analyzed:

<i>Child</i>	<i>Collected by</i>	<i>Age</i>	<i># of utterances</i>
Abe	Kuczaj (1976)	2;4.24 - 2;8.18	3,110
Adam	Brown (1973)	2;3.4 - 2;7.0	9,254
Allison	Bloom (1973)	1;4.21 - 2;10.0	2,192
April	Higginson (1985)	1;10.0 - 2;11.0	2,321
Eve	Brown (1973)	1;6.0 - 2;3.0	12,473
Naomi	Sachs (1983)	1;2.29 - 4;9.3	16,634
Nina	Suppes (1973)	1;11.16 - 3;0.3	23,586
Peter	Bloom (1970)	1;9.8 - 3;1.20	26,898
Sarah	Brown (1973)	2;3.5 - 3;5.13	17,881
Shem	Clark (1978)	2;2.16 - 2;8.29	10,311

For Spanish, we analyzed four longitudinal corpora, to obtain a total sample of 22,130 lines of child speech. Three corpora are from the CHILDES database, and one corpus was recorded and transcribed in our laboratory at the University of Connecticut. The Spanish corpora we examined are as in (20).

(20) Spanish Corpora Analyzed:

<i>Child</i>	<i>Collected by</i>	<i>Age</i>	<i># of utterances</i>
Juan	Jose Linaza	1;7 - 4;11	2,577
Koki	Rosa Montes	1;7 - 2;11	4,548
María	Susana Lopez-Ornat	1;7 - 3;11	8,433
Inés	UConn CLESS Project	1;2 - 2;5	6,572

Both in English and Spanish, the CLAN program Combo (MacWhinney 2000), together with complete files of prepositions and *wh*-words, was used to identify potentially relevant child utterances, which were then searched by hand and checked against the original transcripts to exclude imitations, repetitions, and formulaic routines.

5.2. *Results*

Following Stromswold (1996) and Snyder & Stromswold (1997), the age at which a child produced his or her first clear example of a construction (followed soon after by additional uses) was considered to be the age of acquisition for this construction.

The ages of acquisition for Spanish are shown in (21), and the actual utterances are presented in the Appendix.

(21) Ages of Acquisition (Spanish):

<i>child</i>	<i>direct object wh-question</i>	<i>pied-piping</i>
Juan	3;9	-----
Koki	2;3.21	2;4.18
María	2;0	2;1
Inés	2;5.11	-----

Among the four children, Koki and María acquired both direct-object *wh*-question and pied-piping by the end of their corpora. For these children, the ages of acquisition for these two properties were quite close to each other. For the remaining two children, the first clear use of a direct-object *wh*-question appeared late in their corpora, and there was no clear use of pied-piping.

Crucially, no Spanish-learning child showed any use of P-stranding. This result is consistent with the view that the default for the P-stranding parameter is the setting that leads to pied-piping. Indeed, this possibility receives some support from the fact that both Koki and María, the two children who acquired direct-object *wh*-questions early in their corpora, began to use prepositional questions with pied-piping very soon afterwards.

Let us now turn to English. Of the ten children, nine acquired both direct-object *wh*-questions and P-stranding by the end of their corpora. The ages of acquisition are summarized in (22), and the actual utterances are presented in the Appendix.

(22) Ages of Acquisition (English):

<i>child</i>	<i>direct object wh-question</i>	<i>P-stranding</i>
Abe	2;5.0	2;7.7
Adam	2;5.0	2;5.0
Allison	2;10.0	-----
April	2;1.0	2;9.0
Eve	1;8.0	2;2.0
Naomi	1;11.30	2;8.30
Nina	2;1.12	2;9.13
Peter	2;1.18	2;5.3
Sarah	2;10.11	3;3.7
Shem	2;2.16	2;6.6
<i>average</i>	2;3	2;7

In order to evaluate the statistical significance of observed age differences between acquisition of direct-object *wh*-questions and acquisition of P-stranding, we counted the number of clear uses of the earlier construction before the first clear use of the later construction. We 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 for the next ten transcripts or through the end of the corpus (whichever came first). We then used the binomial test to obtain the probability of the child's producing at least the observed number of examples of the first construction, before starting to use the second construction, simply by chance. The null hypothesis for the test is that the second construction was grammatically available at least as early as the first construction, and had the same relative frequency observed in later transcripts (cf. Stromswold 1996, Snyder & Stromswold 1997).

The results of the statistical analysis are summarized in (23).

(23) Results of the Statistical Analysis:

<i>child</i>	<i>relative frequency</i>		<i>p</i> =
	<i>direct object wh-question</i>	<i>P-stranding</i>	
Abe	.583	.417	$11^{.583} < .01$
Adam	-----	-----	-----
Allison	-----	-----	-----
April	.842	.158	$1^{.842} > .10$
Eve	.818	.182	$48^{.818} < .001$
Naomi	.833	.166	$42^{.833} < .001$
Nina	.826	.174	$12^{.826} > .10$
Peter	.904	.096	$26^{.904} = .073$
Sarah	.786	.214	$10^{.786} = .090$
Shem	.714	.286	$18^{.714} < .01$

Of the nine children who acquired both properties, six (Abe, Eve, Naomi, Peter, Sarah, and Shem) acquired direct-object *wh*-questions significantly earlier than P-stranding (for four children,  $p < .01$  by binomial test; and for two children,  $p < .10$ , marginally significant). Since these children did not use P-stranding as soon as they acquired *wh*-movement, Prediction A in (18a) is falsified: The value that leads to P-stranding cannot be the default.<sup>12</sup>

Furthermore, in the utterances of these six children, we found no example of pied-piping before the acquisition of P-stranding. Since these English-learning children did not pass through a pied-piping stage, Prediction B in (18b) is also false: The value that leads to pied-piping cannot be the default, either. Thus, the time course of acquisition succinctly indicates that the parameter governing the availability of P-stranding does not have any default setting.

## **6. Conclusions**

Evidence from child language has shown that the parameter of P-stranding does not have a default setting. Neither pied-piping nor P-stranding is employed until the child determines the correct setting for her target grammar. The results constitute an empirical argument against the hypothesis in (1), and in turn provide an argument for the weaker hypothesis in (2): Not every parameter has a default specification. A broader implication of this research is that the time course of child language acquisition is a potentially rich source of evidence concerning the nature of parameters (Snyder 1995, 2001, 2002, Sugisaki 2003).

## Notes

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<sup>1</sup> The parameter-setting mechanism based on natural selection developed in Clark (1992) does not postulate default settings.

<sup>2</sup> For the acquisition of P-stranding and pied-piping, see also McDaniel, McKee & Bernstein (1998) and Guasti & Cardinaletti (2003).

<sup>3</sup> For arguments against the account by Hyams (1986), see Bloom (1990) and Valian (1991), among others.

<sup>4</sup> Yet, these effects will not be observed with those parameters that are set “very early” (by the beginning of multi-word combinations, around 1;6). See Wexler (1998:29) for a list of early-set parameters.

<sup>5</sup> There are many syntactic studies on P-stranding that are not discussed here. See Abels (in press), Ayano (2001), and Stowell (1981), for example.

<sup>6</sup> See Baltin & Postal (1996) for empirical problems with the Reanalysis operation.

<sup>7</sup> Kayne (1981) attempts to explain the contrast between English and French, but we use examples from Spanish for ease of exposition. This will not affect the main point of Kayne’s proposal.

<sup>8</sup> Yet, there is evidence from acquisition which suggests that Kayne’s basic idea is on the right track. See Sugisaki, Snyder & Yaffee (2000) and Sugisaki (2003) for details.

<sup>9</sup> A similar idea is independently developed in Salles (1997).

<sup>10</sup> See Isobe & Sugisaki (2002) for an acquisitional evaluation of Law’s (1998) parametric system.

<sup>11</sup> Mark Baker and Maria Teresa Guasti (personal communications) independently pointed out the possibility that the P-stranding parameter consists of two sub-parameters, one of which determines whether P-stranding is possible, and the other of which determines whether a preposition can be pied-piped. This predicts that there are four language types, and according to Baker and Guasti, there are in fact languages in which neither P-stranding nor pied-piping is permitted. Chichewa seems to be one such language.

- (i) Atsikana a-ku-nena za mfumu.  
 girls AGR-pres-talk about chief  
 ‘The girls are talking about the chief.’
- (ii) \*Iyi ndi mfumu zi-mene atiskana a-ku-nena  
 this be chief about-which girls AGR-pres-talking  
 ‘This is the chief about whom the girls are talking.’ (\*pied piping)
- (iii) \*Iyi ndi mfumu imene atiskana a-ku-nena za.  
 This be chief which girls AGR-pres-talking about  
 ‘This is the chief who the girls are talking about.’ (\*P-stranding).

(Mark Baker, personal communication)

This possibility raises several problems, however. First, the above examples from Chichewa involve relative clauses, and we are still not aware of any language in which neither P-stranding nor pied-piping is allowed with *wh*-questions. (We do not have Chichewa data concerning this point.) Second, if this possibility is correct, there should be a language in which P-stranding and pied-piping alternate freely. Again, we are not aware of such a language: At first, English looks like a candidate, but in many contexts it disallows pied-piping.

(iv) \*About what did John talk?

Given these problems, we assume that the parameter of P-stranding is two-valued, as discussed in the text.

<sup>12</sup> Every child showed productive use of PPs before the first clear use of a direct-object *wh*-question. Therefore, the acquisition of PP is not responsible for the delayed acquisition of P-stranding.

### Appendix: First Clear Uses

*English (direct-object question, P-stranding):*

(1) Abe:

- a. \*ABE: what you doing? (Abe002:119)
- b. \*ABE: Mom # what's that for? (Abe 21:274)

- (2) Adam:
- a. \*ADA: what shell doing? (Adam05:24)
  - b. \*ADA: where dat come from? (Adam05:9)
- (3) Allison:
- \*ALI: what does the pig say. (Allison 6:411)
- (4) April:
- a. \*APR: what goat say? (April02:854)
  - b. \*APR: owl to play with. (April04:419)
- (5) Eve:
- a. \*EVE: what doing # Mommy? (Eve05:69)
  - b. \*EVE: it's a bathtub for a boy get in. (Eve18:1980)
- (6) Naomi:
- a. \*NAO: what-'is Mommy doing? (Naomi34:78)
  - b. \*NAO: what-'is this go in? (Naomi70:105)
- (7) Nina:
- a. \*NIN: what is daddy holding? (Nina14:1119)
  - b. \*NIN: who's that you talking to # Momma. (Nina32:1429)
- (8) Peter:
- a. \*PET: Mommy # what you doing. (Peter08:528)
  - b. \*PET: what this come from? (Peter13:2043)
- (9) Sarah:
- a. \*SAR: what my doing? (Sarah 033:522)
  - b. \*SAR: whe(r)e you at . (Sarah052:332)

(10) Shem:

a. \*SHE: what is mommy doing? (Shem01:539)

b. \*SHE: i(t)'s step for sitting on. (Shem15:801)

*Spanish (direct-object question, pied-piping):*

(11) Juan:

\*NIN: zapatillas de deporte no # no cual zapatillas de deporte me  
pon go cual me pongo.

‘tennis shoes no # no which tennis shoes am-I-putting-on which  
am-I-putting-on?’ (J39:76)

(12) Koki:

a. \*KOK: qué tiene?  
what does-he-have? (06Mar81:152)

b. \*KOK: &pa [/] para qué la comp(r)ó?  
for what it bought? (‘what did he buy it for?’)  
(07Apr81:400)

(13) María:

a. \*CHI: qué tomas?  
what are-you-eating? (Transcript200:313)

b. \*CHI: [% señ alando a la cámara] xxx de quién es?  
[pointing to the camera] xxx of whom is?  
(‘who does it belong to?’) (Transcript201:321)

(14) Inés:

\*INE: qué lo hacía más?

what did-he-do it else (i.e., 'what else did he do?')

(INE126:1421)

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