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TOWARD A NEW NATIVISM

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The field of language acquisition is divided over the question of whether the inborn mechanisms underlying linguistic development include actual grammatical categories and principles or are of a more general character. Recent proposals suggest a possible convergence of views on this matter, with implications for the study of both first language acquisition and second language learning. This paper explores this possibility by examining the evolution of grammatical nativism with particular emphasis on a radical shift in the generality of the inborn principles that have been posited in recent work. The nature and implications of this shift are illustrated with the help of developmental data involving gap-containing structures in first and second language acquisition.

For the past 40 years, the study of language acquisition has been marked by ongoing controversy concerning the nature of the inborn mechanisms that interact with experience to yield knowledge of a language. To a considerable extent, the resulting debate has shaped theory and research in the study of both first language acquisition and second language acquisition, resulting in substantial divisions within the field.

In light of this, it is easy to lose sight of the fact that the locus of the controversy is in fact quite bounded and that there are many points of consensus. Indeed, with the possible exception of recent work within the connectionist framework (e.g., Elman et al., 1996), I would venture to say that there is significant agreement within the fields of linguistics and applied linguistics with re-

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spect to the three theses put forward by Schwartz (this volume): Language is knowledge, its locus is the mind, and it is represented (i.e., it is a symbolic system that instantiates a particular cognitive state).

Going one step further, I believe that there is also a near-consensus on the proposition that the human mind includes an innate mechanism—unique to our species—that enables children to acquire an amazingly intricate grammar for their language. Certainly, that position is consistent with a range of views on a spectrum that extends from Chomsky (e.g., 1981) to Slobin (e.g., 1985, p. 1158).

Additionally, there is very substantial agreement among all contemporary theories of syntax concerning the form and content of the grammar that must be acquired. At the very least, it must include an inventory of lexical properties (including information about category membership), it must provide a set of mechanisms for combining words into larger phrases and sentences, and it must impose constraints on phenomena such as pronoun interpretation and gap placement.

Given these minimal requirements, it also seems necessary to agree on one further proposition—namely, that the input to the acquisition device (i.e., the speech of those around the child) is deficient in certain respects. In particular, it includes no direct information about the existence of syntactic categories, about the architecture of the syntactic representations that result from combining words into larger phrases, or about the content of the constraints on pronoun interpretation and on gap placement. (For a general review, see O'Grady [1997, p. 249 ff.]; Schwartz [this volume] provides an illustrative example involving constraints on gap placement.)

Where then is the controversy? Since the early 1960s, the single most significant point of disagreement has centered on the content of the acquisition device. Simplifying somewhat, the dispute can be reduced to the question of whether the acquisition device includes actual syntactic categories and principles. The dominant view within linguistics—as represented by the work of Noam Chomsky and his colleagues on Universal Grammar—is that it does. Let us refer to this position as *special* or *grammatical nativism*.

Running counter to grammatical nativism is the view that the inborn mechanisms involved in language acquisition are of a more general character and do not include a grammar per se. This view has its roots in a long tradition within psychology (going back at least to Piaget in this century) and remains popular today among both psychologists and linguists, especially those committed to functional approaches to language. In earlier work (e.g., O'Grady 1987, 1997), I referred to this perspective as *general nativism* and I will continue to do so here, although the term *cognitive nativism* would perhaps serve just as well.

Until quite recently, it was very easy to distinguish between the two varieties of nativism. Within the last few years, however, the distinction has become less sharp—pointing, I believe, to the possibility of an eventual convergence of views and to the emergence of a new nativism. Before consid-

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ering this possibility further, however, it is first necessary to examine each perspective in slightly more detail. Let us begin with general nativism, which I will take the liberty of discussing with regard to my own work.

TWO VARIETIES OF NATIVISM

Earlier work of mine vacillated somewhat over precisely what the general nativist approach to language acquisition entails. In retrospect, one can see that two separate claims were at stake (e.g., O'Grady 1987, p. 181): the very strong proposition that the categories and principles needed for language acquisition are all independently attested outside of language and the weaker view that these categories and principles are simply not grammatical (i.e., syntactic). Both claims entail that there is no inborn Universal Grammar (i.e., no innate grammatical system), but only the latter claim leaves open the possibility that linguistic development might draw on (nonsyntactic) concepts or mechanisms that are not manifested outside of language.

I now believe that something like the latter view is more plausible (a possibility that I acknowledged in earlier work as well; see, e.g., O'Grady, 1987, p. 193). Some very central components of the acquisition device are indeed manifested outside the language faculty (e.g., the binarity requirement on combinatorial operations, which is also manifested in arithmetical computation; see O'Grady, 1996, p. 380, and 1997, p. 327). But some are apparently peculiar to language (e.g., possibly the Subset Principle and almost certainly the set of notions underlying aspectual distinctions, classifier systems, the dative and locative alternations, and so on; see Pinker, 1989, p. 359). Crucially, however, I continue to maintain that the acquisition device does not include conventional syntactic notions such as noun and subject or constraints such as Principle A ("An anaphor must be bound in some domain") or the Empty Category Principle ("An empty category must be properly governed").

So characterized, even the weaker form of general nativism contrasts sharply with traditional grammatical nativism. I say "traditional" because I believe that at least three stages in the development of the special nativist perspective can be discerned and that recent proposals are quite unlike earlier views.

The first stage, which unfolded in the 1960s and 1970s, adopted the view that the inborn acquisition device includes principles that are formulated in terms of a quite traditional set of grammatical notions that includes subject, noun phrase, clause, and tense, for instance. These are shown in examples (1)–(4).

(1) *The Complex NP Constraint* (Ross, 1967, p. 127)
No element contained in a sentence dominated by a noun phrase with a lexical head noun may be moved out of that noun phrase.

(2) *The Subject Condition* (e.g., Chomsky, 1973, p. 250)
No rule can involve X, Y in the structure . . . X . . . [$_{\alpha}$ . . . Y . . .] . . . where α is a subject phrase containing Y.

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(3) *The Tensed S Condition* (e.g., Chomsky, 1973, p. 238)
No rule can involve X, Y in the structure . . . X . . . [$_{\alpha}$ . . . Y . . .] . . . where α is a tensed S.

(4) *The Specified Subject Condition* (e.g., Chomsky, 1973, p. 239)
No rule can involve X, Y in the structure . . . X . . . [$_{\alpha}$ . . . Z . . . . WYV . . .] . . . where Z is the specified subject* of WYV in α.
*A specified subject is a subject not controlled by X.

A second stage in the evolution of special nativism took place in the 1980s with the elaboration of Government and Binding theory. During this period, the principles of UG drew on unorthodox theory-specific notions of previously unsuspected complexity. For instance, the notion *governing category* that plays a role in the formulation of binding principles A and B has the following definition in *Lectures on government and binding* (Chomsky, 1981, p. 211 ff.):

(5) β is a governing category for α if and only if β is the minimal category containing α, a governor of α, and a SUBJECT accessible to α.

SUBJECT = AGR or the subject of an infinitive, an NP or a small clause.

X is accessible to Y if and only if Y is in the c-command domain of X and assignment to Y of the index of α would not violate (73).

(73) *[$_{\gamma}$ . . . δ . . .], where γ and δ bear the same index.

The notion *proper government*, which plays a crucial role in the formulation of the Empty Category Principle, receives the following definition in *Barriers* (Chomsky, 1986, pp. 14–15):

(6) α properly governs β iff α theta-governs or antecedent-governs β.
α theta-governs β iff α is a zero-level category that theta marks β, and α, β are sisters.
α antecedent-governs β iff α governs β and is co-indexed with it.
α governs β iff α c-commands β and every barrier for β dominates α.
γ is a barrier for β iff (a) or (b):
(a) γ immediately dominates δ, δ a blocking category for β
(b) γ is a blocking category for β, and γ is not IP (S),
γ is a blocking category for β iff γ is not L-marked and γ dominates β,
α L-marks β if α is a lexical category that theta-governs β.

My initial attempt to propose a general nativist theory of grammar and acquisition (O'Grady, 1987) was a reaction to this particular type of grammatical nativism. This attempt had many shortcomings, of course, but it is perhaps possible to see in retrospect why exploratory steps in that direction were tempting and even desirable—despite Chomsky's (1981, p. 344) assessment that UG-based work in this period had "for the first time in . . . history" placed us "in a position to put forward theories that have some of the right properties."

More recently, work on special nativism has entered a third stage. Indeed,

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the Minimalist Program (e.g., Chomsky, 1995) that has grown out of GB theory has essentially abandoned UG as it was conventionally understood. The sorts of constraints exemplified above have been replaced by principles that focus on the notion of economy, demanding short moves (the Minimal Link Condition) that take place only if necessary (Last Resort) and are postponed for as long as possible (Procrastinate). Although one might argue that such computational principles are by definition *grammatical* (because they account for grammatical facts), they are clearly very unlike the inventory of principles making up the sort of Universal Grammar posited in the first 30 years of work in the special nativist tradition. In fact, they are the sort of principles that one would expect to find in almost any computational system. (Indeed, Fukui [1996] has gone so far as to suggest that the economy principles of the Minimalist Program follow from the laws of physics.)

This is not to say that there are not still some vestiges of true special nativism in the Minimalist Program. For example, although Chomsky acknowledged (1995, p. 378) that "[s]omething like [the] Merge [operation][1] is inescapable in any language*like* system" (emphasis WO) (notice the concession that it may be manifested in systems other than natural language), he continued to hold that the Move operation has properties that justify a continued commitment to special nativism. He noted, for example, that [–interpretable] features (e.g., Case and agreement features) have no function in the Minimalist Program other than to trigger movement—a fact that "highlights the special role of the property of displacement of categories that is characteristic of human language" (1995, p. 278).

Moreover, some features have unusual properties for which it is difficult to imagine a nongrammatical motivation. Obvious examples of this include the property that permits multiple nominative patterns in Japanese by allowing a feature to remain active even after being checked and deleted (Chomsky, 1995, p. 286) and the parameter that licenses multiple-subject constructions in Icelandic by permitting an unforced violation of Procrastinate (1995, p. 375). (The ad hoc character of these particular proposals suggests that they may be short-lived, however.)

Exceptions such as these notwithstanding, work on UG has made significant strides in the direction of a more general nativism in the last few years, and I believe that this trend will continue, especially if it turns out to be true (as Elman et al., 1996, pp. 25–27 reported) that evidence from the field of cognitive neuroscience is running against innate representations per se and against the notion of innate domain-specific microcircuitry. Already, it is possible to see places where recent UG-based work allows for contact with general nativism in a way that earlier work did not. This point is worth considering in the context of both first language acquisition and second language acquisition.

FIRST LANGUAGE ACQUISITION

A good deal of work on syntactic development has focused on the relationship between a gap and its filler in structures such as *wh*-questions, relative

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Table 1. Number of children whose first *wh*-question contained a subject gap versus an object gap

Type of question	Subject pattern	Object pattern	Both at the same time
What question	0	8	4
Who question*	4	6	1

Note. One child produced no novel *who* subject or object questions.

clauses, and cleft patterns.[2] A good example of a UG-based approach to this phenomenon can be found in Stromswold's (1995) study of the emergence of *wh*-questions in children's spontaneous speech.

The starting point for Stromswold's (1995) work is the observation that the Empty Category Principle (a typical UG constraint in the second period of the special nativist tradition) recognizes two types of government—a very local and direct type that holds between a head and its complement (lexical government) and a more distant and less direct type that holds between coindexed categories under conditions of c-command (antecedent government). Stromswold suggested that children initially prefer the more local and direct type of government, which leads to the prediction that *wh* object questions (in which the gap is lexically governed by the verb) will be easier than *wh* subject questions (in which the gap is antecedent governed).

(7) Subject *wh*-question
Who __ met Mary?
(8) Object *wh* question
Who did Mary meet __?

The prediction is an extremely interesting one, in part because of its counterintuitive character: It is claimed that the pattern in which the *wh*-word is more distant from the associated gap will be easier than the pattern in which it is adjacent to it. More important from our point of view, Stromswold's prediction—if correct—would be very difficult to explain from a non-UG perspective. But is it correct?

Stromswold (1995) examined question patterns in the spontaneous speech of L2 English-speaking children with a view to determining the relative order of emergence of subject and object *wh*-questions. Using transcripts of parent-child interactions that began when the children's ages ranged from 1;2 to 2;6 and ended when they were from 2;3 to 6;0, Stromswold identified about 13,000 utterances in which the children used question words.

The picture that emerges from this data is somewhat indeterminate, however. Table 1 provides information about the number of children whose first question patterns involved a subject *wh*-question versus an object *wh*-question. Although there seems to be a clear preference for *what* object questions

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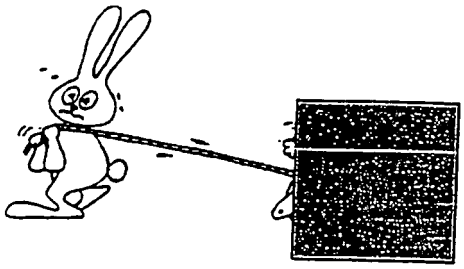


Figure 1. Sample picture used in Yoshinaga's production task.

Table 2. Results of the production task (percent correct); from Yoshinaga (1996, p. 66)

Type of question	Age groups		Overall mean
	2-/3-yr.-olds	4-yr.-olds	
Subject *wh*	71%	82%	76%
Object *wh*	31%	71%	50%

over *what* subject questions, this presumably reflects the fact that inanimate subjects in general are rare in children's speech and that even adults rarely use subject *what* questions (Stromswold, 1995, p. 36). Matters are also less than straightforward in the case of *who* questions. On the one hand, 6 children produced object *who* questions before subject *who* questions, compared to 4 who produced subject *who* questions first. On the other hand, Stromswold's data (p. 32) show that all the children produced more subject questions than object questions; on average, 63% of their *who* questions were subject questions.

In sum, it seems fair to say that Stromswold's data fall short of providing a convincing confirmation of the ECP-based prediction. Indeed, recent work by Yoshinaga (1996) offers a very different picture of the acquisition facts. Yoshinaga's study involved a production task in which subjects were shown pictures depicting an action involving two participants, one of whom was covered over (see Figure 1). The subjects were then given a prompt such as the following (for the *who* object sentence type).

(9) The rabbit is pulling someone. Ernie [a puppet used as a prop] knows who. Can you ask him?

Children who responded correctly to this particular item typically produced the object *wh*-question *Who is the rabbit pulling?*.

A total of 23 children participated in Yoshinaga's (1996) study—twelve 2- and 3-year-olds and eleven 4-year-olds. As summarized in Table 2, Yoshinaga's

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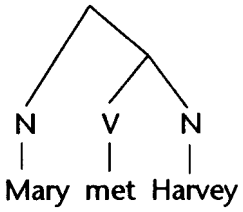


Figure 2. Subject-object asymmetry.

results show a large and statistically significant preference for subject *wh*-questions. Mean performance for all children stood at 76% on subject *wh*-questions, compared to only 50% for object questions, and the 2- and 3-year-olds did more than twice as well on the former patterns than on the latter (71% vs. 31%).[3] These results are compatible with Crain and Thornton's (1998) observation that object gaps were harder than subject gaps in a variety of acquisition experiments that they conducted (p. 124) and that this effect is also found in poor readers and in aphasics (p. 178).

Working in a general nativist framework, I proposed a computational explanation for this (O'Grady, 1997, p. 135). The key to my proposal lies in the subject-object asymmetry that I represent in simplified form in Figure 2. (The postulation of hierarchical structures of this sort underlines a major difference between my version of general nativism and connectionism, whose practitioners tend either to deny the existence of such symbolic representations altogether or to take the position that they can essentially be reduced to linear sequencing [e.g., Ellis 1996].) As I have explained elsewhere (e.g., O'Grady, 1997), both the categories and the hierarchical relations that make up such representations are the product of a general nativist acquisition device—the categories because they can be reduced to a semantic base and the architecture because its essential features follow from a binarity property shared with the arithmetical faculty. Within this perspective, terms such as *direct object* and *subject* are simply mnemonic labels for the verb's inner and outer arguments.

The key idea is that the relative difficulty of subject and object *wh*-questions is determined by the distance (calculated in terms of intervening nodes) between the gap and the *wh*-word. Assuming that there is a gap in the subject *wh*-question (but see note 1), there is one such node in the case of those patterns (i.e., S) and two in the case of object *wh*-questions (i.e., S and VP).

(10) Subject *wh*-question
Who [$_S$ ___ met Mary]?
(11) Object *wh*-question
Who did [$_S$ Mary [$_{VP}$ meet ___]]?

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Table 3. Cleft comprehension test (percent correct); from Lempert and Kinsbourne (1980, p. 374)

Group	Age	Subject clefts*	Object clefts†
I	2;5–3;5	88%	66%
II	3;7–4;5	95%	67%
III	4;6–5;1	100%	69%
IV	5;3–6;3	100%	83%
(Mean)		96%	71%

Note. *e.g., It's the truck that [__ bumps the wagon]. †e.g., It's the wagon that [the truck bumps __].

Table 4. Correct identification of subject and object gaps in relative clauses

Head type	Subject gap	Object gap
Subject head	91%*	45%†
Object head	75%	63%

Note. *e.g., The lion [that the horse kisses __] knocks down the duck. †e.g., The sheep [that __ knocks down the rabbit] stands on the lion.

This leads to the prediction that subject gaps should in general be easier than object gaps, not only in *wh*-questions as Yoshinaga (1996) found but in other types of gap-containing structures as well (including those that are free of the possible confounding effects of subject-auxiliary inversion). This seems to be right. For example, Lempert and Kinsbourne's (1980) study of the comprehension of cleft patterns by 52 children between the ages of 2;5 and 6;3 revealed just such a preference, with performance attaining a mean of 96% on the subject patterns compared to only 71% on the object patterns (see Table 3). Moreover, my recalculation (O'Grady 1997, p. 179) of Tavakolian's (1978) comprehension data involving children whose ages ranged from 3;0 to 5;6 reveals a preference for subject gaps in the case of relative clauses as well (see Table 4).

It is unlikely that frequency effects in the input can explain these results. In the case of *wh*-questions, for example, subject gaps appeared to be dominant in the speech of most caregivers, but not all: These patterns made up only 17% of the *who* questions in the speech of one of Stomswold's 12 adult subjects and 30% of another. I know of no data on the relative frequency of relative clauses in speech to children, but Fox (1987, p. 857) reported finding an equal number of subject and object relatives in the large sample of conversational English that she examined. This suggests that computational factors play a greater role than input in determining the relative difficulty of filler-gap relationships.

The computational explanation is of deeper interest for at least two reasons. First, it is obviously less grammatically grounded than the ECP account.

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Table 5. Percent of relative clauses correct by language group; from Gass (1979, p. 340)

Native language	Subject gap	Direct-object gap	Object of a preposition gap
Arabic	48%	28%	27%
Thai	90%	30%	25%
Romance	68%	28%	17%
Persian	70%	20%	18%
Chinese, Japanese, and Korean	78%	60%	28%

In appealing to considerations of computational cost and economy, it clearly presupposes inborn mechanisms—but these need not be specifically grammatical in character. Rather they have properties that one would expect to find in any computational system that is implemented by neurological mechanisms with finite resources.

Second—and relevant to the matter of the convergence of views on nativism—a virtually identical account of computational cost is found within the most recent (i.e., minimalist) variety of the special nativist tradition. Collins (1994, p. 56) suggested that the length of a derivation (which, in turn, correlates with its optimality) is determined by two considerations—the number of operations involved and (in the case of movement operations) the number of nodes traversed. As can easily be seen, the latter measure of cost yields essentially the same predictions as the proposal I have made.

SECOND LANGUAGE ACQUISITION

So far, I have focused my remarks on first language acquisition. I believe, though, that everything I have said is applicable to the study of second language acquisition as well. In particular, if I was right in proposing that the inborn computational system employed in the case of first language acquisition is also available for second language learning (O'Grady, 1996),[4] one would expect L2 learners to manifest comparable asymmetries in the development of gap-containing structures. Results from a number of studies suggest that this prediction is borne out.

For example, in a production task involving 17 high-intermediate and advanced second language learners from various L1 backgrounds, Gass (1979) found that performance declined as the depth of embedding of the gap increased. Thus, relative clauses containing subject gaps were easier than those containing direct-object gaps, which in turn were easier than those containing a gap inside a prepositional phrase (see Table 5).[5] (Hildebrand, 1984, established that gaps inside PPs are more difficult than direct-object gaps and subject gaps in the case of first language acquisition as well.)

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(12) *Easiest*: Subject gap: I met someone [who ___ introduced Sue to Bob].
Direct-object gap: I met someone [who Mary introduced ___ to Bob].
Hardest: Gap inside PP: I met someone [who Mary introduced Sue to ___].

In a free composition task involving the same learners, Gass (1980, p. 140) found that 76% of relative clauses involved subject gaps, compared to 15% with direct-object gaps. Doughty (1991, pp. 450–451) reported comparable findings for a different group of 20 ESL learners.

Other work has confirmed and extended these findings in a variety of ways. For example, based on a production experiment involving 35 adult Japanese-speaking learners of English, Wolfe-Quintero (1992) reported that relative clauses and *wh*-questions in which the gap occurs inside a PP that is itself embedded inside an NP are significantly more difficult than patterns in which it is not so deeply embedded.

(13) *Easiest*: Gap inside a VP:
What is the old man [$_{VP}$ eating ___ in a restaurant]?
Gap inside a PP embedded inside a VP:
What is the little girl [$_{VP}$ playing [$_{PP}$ with ___] in the yard]?
Hardest: Gap inside a PP contained inside an NP:
What is the old man [$_{VP}$ telling [$_{NP}$ a story [$_{PP}$ about ___]]]?

A completely different type of support for the relevance of gap placement to sentence formation comes from studies by Gass (1982), Eckman, Bell, and Nelson (1988), and Doughty (1991) on the effects of instruction on second language acquisition. The key finding of these studies is that second language learners who are taught to produce relative clauses with gaps inside prepositional phrases can carry this ability over to relative clauses with gaps in direct-object position and subject position, but that the reverse is not true. (Thus, the ability to produce relative clauses with a gap in the direct-object position does not entail the ability to produce relative clauses with a gap inside a prepositional phrase.) This is of course expected, if the relative difficulty and markedness of gaps is correlated with their structural distance from the filler.[6]

CONCLUSION

In sum, if this picture of the acquisition device and of second language acquisition is correct, then there is perhaps room for agreement on one further point. In particular, it seems that knowledge of a second language is fundamentally similar to knowledge of a first language. (That is, the two are epistemologically equivalent, to use Schwartz's [this volume] term.) More specifically, both can be traced to a cognitive system (a grammar) that builds representations with a particular composition and architecture in accordance with constraints that are sensitive to the sorts of computational factors exemplified here.

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If this is right, the particular illustrations considered above may be signs of a much broader convergence of views concerning both the nature of human language and the role of inborn mechanisms in its ontogeny. It is perhaps not too optimistic to see in this possibility indications of genuine progress in the study of language acquisition.

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NOTES

1. The Merge operation combines a pair of syntactic objects that enter into an appropriate relationship with each other (e.g., head-complement). It is essentially identical to *application* in categorial grammar.

2. For the purposes of this discussion, nothing turns on whether this relationship is captured by movement or by feature-passing, and I will treat the two analyses as variants of the same idea.

3. Errors in subject-auxiliary inversion and other factors irrelevant to the syntax of the *wh*-words themselves were ignored in calculating these results.

4. I do not claim that the entire L1 acquisition device is available for second language learning, however. Both the conceptual module (which provides the notions underlying grammatical contrasts such as *the* and *a* in English or *ga* and *wa* in Japanese) and the perceptual module (necessary for phonemic and subphonemic contrasts) seem to be significantly compromised in the case of adult L2 learners. See O'Grady (1996) for further discussion of these matters.

5. Gass (1979) also examined relatives in genitive position, which are special in ways that need not concern us here, and those involving objects of comparison (e.g., *I know someone who Harvey is smarter than*), which predictably had the lowest scores of all.

6. The use of computational and processing complexity to account for developmental facts is common in the literature on SLA (see Pienemann, 1989, and Ellis, 1996, for two quite different examples), and there is considerable difference of opinion concerning the precise factors involved and their relevance in first language acquisition. Although I have focused here only on structural distance, which seems also to be important for first language acquisition, I acknowledge that other factors may also enter into the development of gap-containing structures, including (for example) linear distance, which tends to be confounded with structural distance in English. For suggestive discussion of the latter possibility, see Tarallo and Myhill (1983), Hawkins (1989), and Lee (in press).

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