3 The Radical Middle: Nativism without Universal Grammar

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1 Introduction

A phenomenon as puzzling and complex as language acquisition is no doubt worthy of the controversy that its study has engendered. Indeed, it would be unreasonable to expect a broad consensus on such a profoundly mysterious phenomenon after a mere 30 or 40 years of investigation, much of it focused on the acquisition of a single language.

Under these circumstances, the most that can perhaps be hoped for in the near term is some agreement on the research questions that need to be addressed and on the merits and shortcoming of the various explanatory ideas that are currently being pursued. In the longer term, of course, one hopes for a convergence of views, and even now there is some indication that this has begun in a limited way, as I will explain below. Nonetheless, for the time being at least, there is still ample room for disagreement on many important points.

The purpose of this chapter is to outline a view of language acquisition – both first and second – that is sometimes referred to as "general nativism." I will begin in the next section by offering an overview of this approach, including its principal claims and the major challenges that it faces. Section 3 outlines a general nativist theory of syntactic representations with respect to a well-established asymmetry in the development of relative clauses in the course of first and second language acquisition. Section 4 addresses the possible advantages of general nativism compared to other theories of language acquisition.

2 Defining General Nativism

There is a near-consensus within contemporary linguistics (which I will not question here) that language should be seen as a system of knowledge – a sort of "mental grammar" consisting of a lexicon that provides information about

the linguistically relevant properties of words and a computational system that is responsible for the formation and interpretation of sentences.

The details of the computational system and even of the lexicon are the subject of ongoing dispute, of course, but there is substantial agreement on a number of points. For instance, it seems clear that the grammar for any human language must assign words to categories of the appropriate type (noun, verb, etc.), that it must provide a set of mechanisms for combining words into phrases and sentences with a particular internal architecture, and that it must impose constraints on phenomena such as "movement" and pronoun interpretation.

What makes matters especially interesting for theories of language acquisition is that grammars that include even these basic and relatively uncontroversial mechanisms are underdetermined by experience in significant ways. As far as we can tell, for instance, the input to the acquisition process (i.e., the speech of others) includes no direct information about the criteria for category membership, the architecture of syntactic representations, or the content of constraints on movement and pronoun interpretation. (For a general review, see O'Grady, 1997, pp. 249 ff.) How then can a language be acquired?

Theories of linguistic development typically address this problem by assuming that children are endowed with an "acquisition device" – an innate system that both guides and supplements the learner's interaction with experience. This much is accepted by a broad spectrum of researchers ranging from Slobin (e.g., 1985, p. 1158) to Chomsky (e.g., 1975, p. 13), but differences arise on one important point. In one class of acquisition theories, a significant portion of the grammar is taken to be "given in advance" by the acquisition device. This grammatical component of the inborn acquisition device is known as Universal Grammar, or UG – a system of categories and principles that is taken to determine many of the core properties of human language (see figure 3.1). Such theories are instances of what might be called "grammatical nativism," since they adopt the view that the innate endowment for language includes actual grammatical categories and principles. Elsewhere, I have referred to this view as "special nativism" (O'Grady, 1997, p. 307), because of its commitment to the existence of innate mechanisms with a specifically grammatical character (see also White, this volume).

Grammatical nativism contrasts with "general nativism," which posits an innate acquisition device but denies that it includes grammatical categories or principles per se. According to this view (which might also be labeled "cognitive nativism" or "emergentism," as is more common these days), the entire grammar is the product of the interaction of the acquisition device with experience; no grammatical knowledge is inborn (see figure 3.2) (see Ellis, this volume).

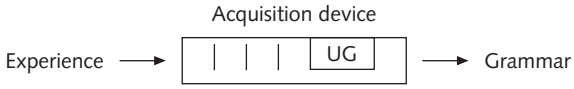

Figure 3.1 The UG-based acquisition device

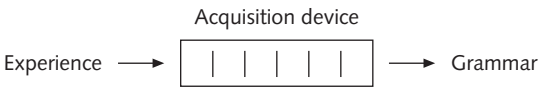

Figure 3.2 The general nativist acquisition device

Later in this chapter, I will suggest that there are some signs of convergence between general nativism and recent versions of grammatical nativism. For now, though, I would like to emphasize the profound historical difference between the two views. UG is not simply the name for whatever mechanisms happen to be involved in grammatical development. As I interpret the literature on grammatical nativism, proponents of the view that UG is part of the acquisition device subscribe to a very strong claim about its content and character – namely, that it is an *autonomous* system of *grammatical* categories and principles – autonomous in the sense that it is not reducible to non-linguistic notions and grammatical in the sense that it is primarily concerned with matters of well-formedness, not parsing or processing or other types of language-related cognition. (For detailed discussion, see Newmeyer, 1998.) All varieties of general nativism reject these assumptions, however much they may disagree on what the acquisition device actually does comprise.

Skepticism concerning UG is widespread in the field of language acquisition research. Relatively little of the literature on first language acquisition is couched within a UG framework, and the same seems to be true of the literature on second language acquisition as well. In addition to the huge amount of work that simply ignores UG, there is also a substantial and varied literature that explicitly rejects it in one form or another. This includes work by Martin Braine (1987), Dan Slobin (1985), Melissa Bowerman (1990), and Michael Tomasello (1995) (among many others) on first language acquisition and work by Eric Kellerman (Kellerman and Yoshioka, 1999), Fred Eckman (1996), Kate Wolfe-Quintero (1992, 1996), and others on second language acquisition. It should be noted, though, that there is no unified general nativist approach to language acquisition and certainly no agreement on the particular views that I outline in the remainder of this chapter.

As I see it, the principal limitation of most work on general nativism lies in its failure to develop a theory of learnability and development that is tied to an explicit and comprehensive theory of grammar (see also Gregg, 1996). Most non-UG work is quite casual in its approach to syntax: the phenomena whose acquisition is being investigated are typically analyzed informally and on a case-by-case basis, without reference to an overarching syntactic theory. By contrast, work in the special nativist tradition has not only put forward a theory of learnability (built around an inborn UG) but linked it to a far-reaching and explicit theory of grammar (transformational grammar in its various incarnations).

For reasons that I will discuss further below, the most promising theories of language posit explanatory principles that make reference to phonological,

syntactic, and semantic *representations* of various sorts. Yet the vast majority of work on general nativism either makes no reference to such representations or adopts a very casual view as to their properties, typically avoiding any explicit proposal about their architecture or ontogeny.

A good illustration of this point comes from an important body of research on the acquisition of relative clauses by second language learners (e.g., Doughty, 1991; Eckman, Bell, and Nelson, 1988; Gass, 1979, 1980). This work has yielded a robust and interesting finding: subject relative clauses such as (1) are easier than direct object relatives such as (2) for second language learners. (The same seems to be true for first language acquisition, all other things being equal; see O'Grady, 1997, p. 179 for discussion.)

(1) *Subject relative:*
the truck that [_ pushed the car]

(2) *Object relative:*
the truck that [the car pushed _]

Further, it has been observed that this finding parallels an important generalization in syntactic typology dating back at least to Keenan and Comrie (1977): direct object relatives are more marked than subject relatives. (That is, some languages have only subject relatives, but any language with direct object relatives must also permit subject relatives.)

The developmental pattern and its relationship to Keenan and Comrie's typological generalization raise questions that force us to address the two principal explanatory challenges confronting contemporary linguistics:

i Why is language the way it is (e.g., why do all languages with direct object relatives also have subject relatives, but not vice versa)?
ii How is it acquired (e.g., why are subject relatives easier for language learners than direct object relatives)?

It is my position that neither of these questions can be answered without reference to hierarchically structured symbolic representations. On this view, then, the first priority for general nativism must be a theory of syntactic representations that includes a proposal about their composition and architecture.

3 A General Nativist Theory of Representations

In a number of recent publications (e.g., O'Grady, 1996, 1997, 1998), I have put forward the outlines of a general nativist theory of syntactic representations. As I see it, the key to such a theory lies in two propositions. First, syntactic categories, which are treated as purely formal elements in special nativism, must be reducible to a semantic base. I have made one proposal about precisely how

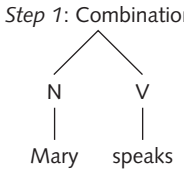

Figure 3.3 First step in the formation of the sentence *Mary speaks French*

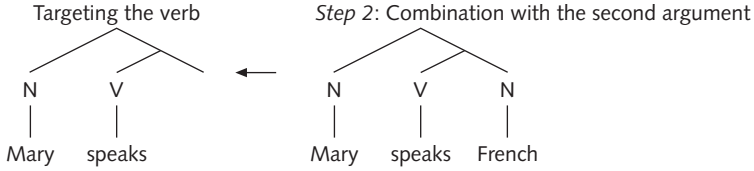

Figure 3.4 Second step in the formation of the sentence *Mary speaks French*

this might be achieved (O'Grady, 1997, 1998), and other ideas can be found in the literature on grammatical categories (e.g., Croft, 1991; Langacker, 1987).

Second, contra the view adopted within UG-based approaches to language acquisition, the computational principles that combine and arrange words to form phrases and sentences cannot be specifically grammatical in character (that is, there is no X-bar Schema, no Empty Category Principle, and so forth). How then do we account for the sorts of grammatical phenomena that have been the focus of so much linguistic research since the early 1960s?

In recent work on this matter (e.g., O'Grady, 2001b), I have proposed that the theory of sentence structure can and should be unified with the theory of sentence processing. As I see it, the processor itself has no specifically grammatical properties. Rather, its design reflects two more general computational features – a propensity to operate on pairs of elements (a characteristic of the arithmetical faculty as well)[1] and a propensity to combine functors with their arguments at the first opportunity (a storage-reducing strategy that I refer to simply as "efficiency"). The system operates in a linear manner (i.e., "from left to right"), giving the result depicted in figure 3.3 in the case of a simple transitive sentence such as *Mary speaks French*.

In the next step, the verb combines directly with its second argument, an operation that requires splitting the previously formed phrase in the manner depicted in figure 3.4. (Such an operation has long been assumed, at least implicitly, in the literature on sentence processing; see, e.g., Frazier, 1987, p. 561; Levelt, 1989, p. 242; Marcus, 1980, pp. 79–80.)

Syntactic representations in this type of efficiency-driven computational system have the familiar binary-branching design, with the subject higher than the direct object – but not as the result of an a priori grammatical blueprint such as the X-bar schema. Rather, their properties are in a sense epiphenomenal – the by-product of a sentence formation process that proceeds from left to

right, combining a verb with its arguments one at a time at the first opportunity. Syntactic representations are thus nothing more than a residual record of how the computational system goes about combining words to form sentences.

The architecture of the proposed syntactic representations offers a promising account of why subject relatives are easier than direct object relatives. The key idea is that the relative difficulty (and, by extension, the developmental order) of structures that contain gaps is determined by the distance (calculated in terms of intervening nodes) between the gap and its filler (e.g., the nominal modified by the relative clause). As illustrated in (3) and (4), there is one such node in the case of subject relatives (i.e., S) and two in the case of object relatives (i.e., S and VP):[2]

(3) *Subject relative:*
the truck that [$_S$ _ pushed the car]

(4) *Direct Object relative:*
the truck that [$_S$ the car [$_{VP}$ pushed _]]

A problematic feature of English is that structural distance is confounded with linear distance: subject gaps are not only less deeply embedded than object gaps, they are also linearly closer to the head noun. In order to ensure that structural distance rather than linear distance is responsible for the contrast in the difficulty of relative clauses, it is necessary to consider the acquisition of languages such as Korean, in which the relative clause precedes the head. (The verbal suffixes in Korean simultaneously indicate both tense and clause type. RC = relative clause.)

(5) a. *Subject relative:*
[$_S$ _ namca-lul cohaha-nun] yeca
man-Acc like-RC.Prs woman
"the woman who likes the man"
structural distance: one node (S)
linear distance: two words

b. *Direct object relative:*
[$_S$ Namca-ka [$_{VP}$ _ cohaha-nun]] yeca
man-Nom like-RC.Prs woman
"the woman who the man likes"
structural distance: two nodes (VP and S)
linear distance: one word

If structural distance is the key factor, then the subject relative should be easier; on the other hand, if linear distance is the key factor, the direct object relative should be easier. O'Grady, Lee, and Choo (forthcoming) investigated this matter with the help of a comprehension task (see box 3.1), uncovering a strong and statistically significant preference for subject relative clauses.

Box 3.1 The acquisition of relative clauses in Korean as a second language (O'Grady et al., forthcoming)

Research questions: Is there a subject–object asymmetry in the acquisition of Korean relative clauses? If so, does it reflect a contrast in linear distance or in structural distance?

Methodology:
Subjects: 53 native English speakers studying Korean as a second language – 25 second-semester students at the University of Texas at Austin, 20 fourth-semester students at the same institution, and 8 fourth-semester students at the University of Hawai'i at Manoa.

Task: Picture selection, in accordance with the following instructions:

> Each page of this booklet contains a series of three pictures. As you go to each page, you will hear a tape-recorded voice describing a person or animal in one of the three pictures. Your job is simply to put a circle around the person or animal described in the sentence. (Do NOT put the circle around the entire box.)

Figure 3.5 presents a sample page from the questionnaire.

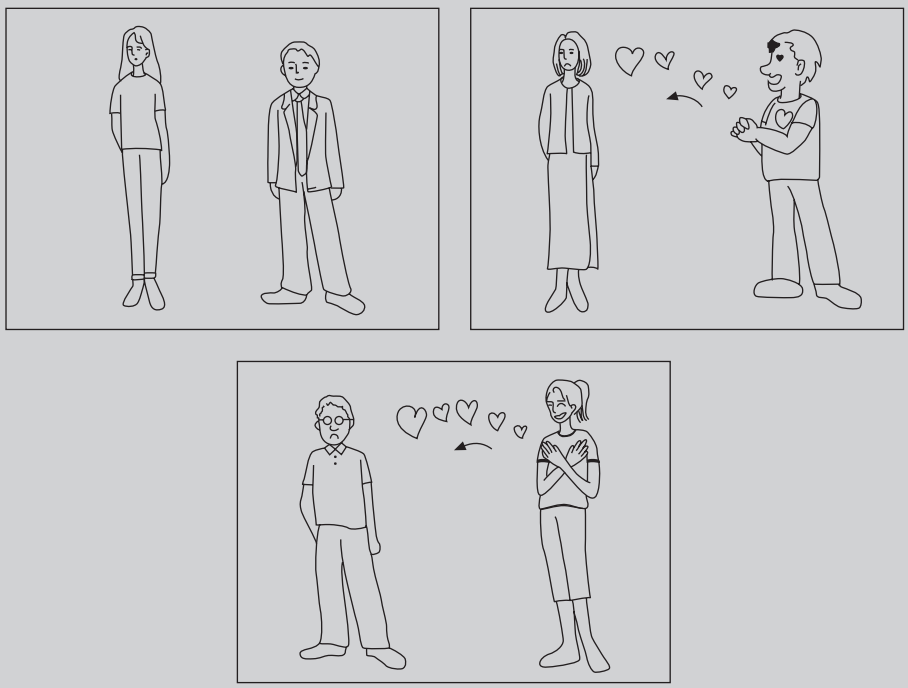

Figure 3.5 Sample test items

Subjects who correctly understand relative clauses should circle the right-hand figure in the third panel in response to a subject relative clause such as (ia) and the left-hand figure in the second panel in response to a direct object relative such as (ib):

(i) a. *Subject relative clause:*
[_ namca-lul cohaha-nun] yeca
man-Acc like-RC.Prs woman
'the woman who likes the man'
b. *Direct object relative clause:*
[namca-ka _ cohaha-nun] yeca
man-Nom like-RC.Prs woman
'the woman who the man likes'

Results: The subjects did far better on subject relative clauses than on direct object relatives, with scores of 73.2 percent correct on the former pattern compared to only 22.7 percent for the latter. This contrast is highly significant (F 30.59, p = .0001). Equally revealing is an asymmetry in reversal errors (i.e., the number of times a pattern of one type was misanalyzed as a pattern of the other type): direct object relatives were misunderstood as subject relatives 115 times while subject relatives were misanalyzed as direct object relatives only 26 times – a clear indication that subject relatives are the easier pattern.

Conclusion: Learners of Korean as a second language find subject relatives far easier than direct object relatives, which supports the claim that structural distance between a gap and its filler is the key factor in determining the relative difficulty of these patterns.

If the structural distance account is correct, we expect to find comparable asymmetries in the development of other gap-containing structures as well. *Wh*-questions are a case in point. As illustrated in (6) and (7), subject and object *wh*-questions exhibit a contrast that parallels the asymmetry found in relative clauses:

(6) *Subject wh-question:*
Who [$_S$ _ met Mary]?

(7) *Object wh-question:*
Who did [$_S$ Mary [$_{VP}$ meet _]]?

The relative difficulty of these two patterns has been studied for both first language acquisition (Yoshinaga, 1996) and second language acquisition (Kim, 1999) with the help of an elicited production task. Both studies revealed significantly better performance on subject *wh*-questions and a strong tendency for these patterns to be used in place of their direct object counterparts, but not vice versa.

By adopting a particular theory of syntactic representations, then, we are able to uncover a plausible computational explanation for why object relatives are more difficult than subject relatives for language learners and for why object wh-questions are harder than subject *wh*-questions. This is a potential step forward, not only because it helps explain the developmental facts, but also because it sheds light on the typological facts as well.

In particular, it makes sense to think that the cut-off points that languages adopt in defining the limits for relative clause formation are determined by the same measure of computational complexity that defines developmental difficulty. Thus, subject relatives – the computationally simplest structure – will be the most widespread typologically.[3] Moreover, any language that allows the computationally more difficult direct object relatives will also permit the simpler subject relatives. And so on.

This cannot be all there is to it, of course. Syntactic representations have properties other than just binarity, and syntactic principles make reference to more than just structural distance. The illustration given here omits many details in order to make the key point – which is that the best prospects for an explanatory general nativist theory of language lie in an approach that takes syntactic representations as its starting point. As we have just seen, reference to such representations allows us to make a proposal not only about how language is acquired (e.g., why subject relatives are acquired first) but also about why language is the way it is (e.g., why any language that allows object relatives must also allow subject relatives).

The parallels between first and second language acquisition that are manifested in the emergence of relative clauses lend credence to the idea that the two phenomena are fundamentally alike, at least in some respects. I believe that this is right, at least insofar as computational operations are concerned. The matter is hardly clear, though. Indeed, the facts are somewhat difficult to interpret: as Bley-Vroman (1994, p. 4) has observed, experimental work on computational principles in second language acquisition has yielded indecisive results – "better than chance, [but] far from perfect." Although this seems to suggest diminished access to the computational mechanisms underlying sentence formation, a less pessimistic view is adopted by Uziel (1993), who follows Grimshaw and Rosen (1990) in arguing that any indication that learners perform above the level of chance on contrasts involving computational principles should be interpreted as evidence for access to those principles – a not unreasonable proposal in light of the many extraneous factors (e.g., inattention, processing limitations, vocabulary deficits, nervousness, and so forth) that can interfere with performance in experimental settings. (See also White, this volume.)

If this is right, then performance on computational principles should improve as the effect of extraneous factors diminishes. There is already some indication that this is right: Kanno (1996) investigates the status of a computational principle that is responsible for the asymmetry in the admissibility of case drop in subject and direct object positions in Japanese (see section 4 for details). Because the contrast is manifested in very simple sentences, Kanno was able to elicit

grammaticality judgments for sentences that were just two and three words long, thereby dramatically diminishing the potential effect of extraneous factors. Interestingly, she reports that adult learners of Japanese as a second language do not perform significantly differently from native speakers in assessing the relative acceptability of the two patterns.

Why then are adults such poor language learners? There are a number of possibilities, of course, two of which I find particularly interesting. First, it is evident that some parts of the language faculty fare less well than the computational system with the passage of time. For instance, the ability to distinguish among phonemic contrasts apparently begins to diminish by the age of 12 months (Werker, Lloyd, Pegg, and Polka, 1996), with the result that language acquisition after age six or so typically results in a foreign accent (Long, 1990, p. 266). There also appears to be a significant decline in learners' ability to exploit subtle semantic contrasts, including those underlying such familiar phenomena as the *the/a* contrast in English (Larsen-Freeman and Long, 1991, p. 89) or the *wa/ga* (topic/nominative) contrast in Japanese (Kuno, 1973, p. 37; Russel, 1985, p. 197). This suggests that the acquisition device comprises several autonomous components (at least a computational module, a perceptual module, and a conceptual module), each with its own maturational prospects and its own role to play in shaping the outcome of second language learning.

A second possibility, which focuses just on syntactic deficits (see, e.g., O'Grady, 2001a), is that the computational system, while intact, is underpowered in the case of adult language learners. The effects of this deficit are manifested in patterns which, for one reason or another, place extra demands on the computational system. One such pattern involves object relative clauses, which require the establishment of a link between a direct object gap and a structurally distant filler. As we have seen, both children and adults have trouble with these patterns compared to subject relative clauses. Interestingly, similar problems have been observed in agrammatic aphasics (e.g., Grodzinsky, 2000).

Another sort of pattern that may place an extra burden on the computational system involves double object datives such as (8), compared to their prepositional dative counterparts as in (9):

(8) *Double object dative:*
agent *goal* *theme*
The boy sent the donkey the horse.

(9) *Prepositional dative:*
agent *theme* *goal*
The boys sent the horse to the donkey.

As observed by Dik (1989), Langacker (1995, pp. 18–20), and Talmy (1988), among others, the word order employed in the prepositional pattern (agent–theme-goal) is iconic with the structure of the event, which involves the agent

acting on the theme and then transferring it to the goal, giving the "action chain" (to employ Langacker's term) depicted in (10):

(10) agent → theme → goal

Interestingly, the double object dative, with its non-iconic agent–goal–theme order, is harder to comprehend, both for children in the early stages of language acquisition (Osgood and Zehler, 1981; Roeper, Lapointer, Bing, and Tavakolian, 1981; Waryas and Stremel, 1974) and for adult second language learners (Hawkins, 1987; Mazurkewich, 1984; White, 1987). And here again, agrammatic aphasics have been found to have difficulty with this pattern too (Caplan and Futter, 1986; Kolk and Weijts, 1996, p. 111; O'Grady and Lee, 2001).

All of this suggests that in the early stages of language acquisition (and perhaps in the case of agrammatism as well) the computational system may be too underpowered to reliably execute the more demanding tasks involved in natural language processing, including dealing with long-distance dependencies and non-iconic word order. Whereas children routinely overcome this deficit, its effects in the case of adults may be longer lasting, contributing to the pattern of partial attainment that is typical of second language learning.

4 The Advantages of General Nativism

In evaluating general nativism, it is useful to compare it with two well-known alternatives – UG-based special nativism, which posits inborn grammatical categories and principles, and connectionism, certain varieties of which deny the existence of traditional symbolic representations and principles altogether (e.g., Elman, Bates, Johnson, Karmiloff-Smith, Parisi, and Plunkett, 1996). Each approach has its own merits, of course, but it is nonetheless possible to identify considerations that justify continued pursuit of the general nativist research program.

The *potential* advantage of general nativism with respect to special nativism is obvious. All scientific work, including the special nativist research program, seeks the most general properties and principles possible. One does not posit a grammatical rule specifically for passivization if the properties of passive structures can be derived from a more general grammatical principle. And one does not posit a grammatical constraint if the phenomena that it accounts for can be derived from principles that are not specific to the language faculty. (For an identical view within grammatical nativism, see Lightfoot, 1982, p. 45.)

Interestingly, the pursuit of this very goal within the special nativist research program has led to a partial convergence of views with general nativism in recent years. As observed in O'Grady (1999), work within the "Minimalist Program" that has grown out of Government and Binding theory (e.g., Chomsky, 1995) suggests that UG as it was conventionally understood is being abandoned even by those traditionally committed to grammatical nativism in

its strongest form. The latest generation of explanatory principles focuses 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") – in short, the sort of principles that one would expect to find in almost any computational system. (In fact, Fukui, 1996, has gone so far as to suggest that the economy principles of the Minimalist Program follow from the laws of physics!)[4]

A concrete example of this convergence of views can be seen in the treatment of gap-containing structures in the two varieties of nativism, where one can find parallel proposals for calculating relative complexity and markedness. As explained above, I have suggested that the relative ease of subject gaps compared to object gaps can be explained with reference to their distance from the "filler" (the head in the case of relative clauses, the wh-word in the case of questions). Working within the minimalist program, Collins (1994, p. 56) has put forward a virtually identical proposal: the cost of "movement operations" is determined by the number of nodes traversed.

In the final analysis, then, general and special varieties of nativism agree on the existence of an inborn acquisition device, of hierarchically structured symbolic representations, and of explanatory principles that refer to these representations. The principal difference between the two approaches revolves around the precise nature of these constructs, with disagreement centered on the question of whether the language faculty includes inborn categories and mechanisms that are narrowly grammatical in character. But even here, there is agreement that we should seek out the most general constructs that are consistent with a viable account of the properties of language and the facts of development. What remains to be determined is whether some of these constructs have the status necessary to justify continued adherence to the traditional conception of Universal Grammar.

At first glance at least, the type of general nativism advocated here shares much less common ground with connectionism. This is somewhat ironic since, in a sense, connectionism is an extreme form of general nativism. Indeed, some of its current proponents (e.g., Elizabeth Bates and Brian MacWhinney) were earlier associated with a more traditional general nativist perspective (e.g., Bates and MacWhinney, 1988), and Elman et al. (1996, p. 114) note that connectionism embodies aspects of Piaget's (general nativist) theory of the mind.

As I see it, the attractiveness of connectionism stems in large part from the fact that it takes the pursuit of generality so seriously, ultimately arriving at the strongest possible conclusion concerning the nature of the human language faculty – namely that it has no special properties of its own, grammatical or otherwise. This idea deserves to be taken seriously. Ultimately, though, the connectionist program must be evaluated in terms of the same criteria as apply to all theories of language: it must account both for how language is acquired and for why it is the way it is. To date, connectionist work seems to have concentrated almost exclusively on the former question. There have been

impressive results in this area, but, for me at least, the challenge of explaining why language is the way it is has yet to be satisfactorily addressed. A simple example will help illustrate this point.

As is well known, many languages exhibit so-called "subject–verb" agreement: affixation on the verb records person and number features of the subject. For example:

(11)

	English	Spanish
3rd person, singular subject:	That man work**s** hard.	Ese hombre traba**ja** mucho.
3rd person, plural subject:	Those men work∅ hard.	Esos hombres traba**jan** mucho.

We know from the intriguing work of Elman (1993) and others that it is possible to build a connectionist net that can "learn" subject–verb agreement without reference to hierarchical syntactic representations per se. Moreover, on the face of it, it appears that such a proposal could count as an explanation for how at least this feature of language is acquired.

But there is another challenge here. This is because the same connectionist net could almost certainly "learn" a language – call it Lisheng – in which agreement is triggered by the direct object rather than the subject:

(12)

	Lisheng
3rd person, singular object:	I visited-**a** that city.
3rd person, plural object:	I visited-**an** those cities.

The problem is that there is apparently no such language: there are languages such as English and Spanish in which the verb agrees only with the subject and languages such as Swahili in which the verb agrees with both the subject and the direct object, but no languages in which the verb agrees only with the direct object (e.g., Croft, 1990, p. 106). Why should this be?

This asymmetry has a straightforward explanation in theories of language that make use of hierarchically structured syntactic representations: the need for agreement to mark a head–argument relation increases with the computational distance between the two elements. Since verbs are structurally closer to their direct objects than to their subjects in the sort of representation that I posit, it follows that the need for agreement is greater in the latter case. This is true not only for SOV languages such as Tamil, in which the subject is linearly more distant from the verb, but also for SVO languages such as English, in which the subject and direct object are both adjacent to the verb, and for VSO languages such as Irish, in which the subject is linearly closer to the verb than is the direct object (see figure 3.6).[5]

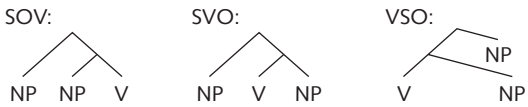

Figure 3.6 The subject–object asymmetry

Syntactic representations such as these shed light on other phenomena as well. For instance, it is surely no accident that in languages such as Japanese, case can be dropped from the direct object but not from the subject (Fukuda, 1993): the need for case presumably is greater on the more distant of the verb's arguments:

(13) a. *Case drop on the subject:*
*Dare gakusei-o nagutta-no?
who student-AC hit -Ques
'Who hit the student?'
b. *Case drop on the direct object:*
Gakusei-ga dare nagutta-no?
student-Nom who hit -Ques
'Who did the student hit?'

Explanations such as these are plainly based on processing considerations. As such, they are perfectly compatible with Elman et al.'s hint (1996, p. 386) that linguistic universals are perhaps attributable to processing mechanisms – an idea that they do not develop. Crucially, however, the specific processing factors that underlie agreement and case drop asymmetries come to light only when we consider symbolic representations with the defining properties of traditional syntactic structure – binary branching and a subject–object asymmetry. (Recall, though, that these architectural features are derived from general computational properties, not UG, in the approach that I adopt.) It remains to be seen how and whether the connectionist program deals with these issues.

In the course of proposing an account for why language is the way it is with respect to phenomena such as agreement and case drop, a theory based on traditional symbolic representations also takes us a good deal of the way toward understanding how language is acquired. In the case of agreement, for instance, it seems reasonable to suppose that the computational demands associated with keeping track of the structurally more distant verb–subject relation create a place in syntactic representations where agreement would be especially welcome.

Confounding factors make it difficult to test this prediction against developmental data, since subject agreement morphemes are more frequent than their object agreement counterparts and may occur in the more salient word-initial or word-final position (vs. word-medial position). Nonetheless, the developmental facts are at least suggestive.

In languages with both subject and object agreement, there seem to be only two developmental patterns: either subject agreement is learned before object agreement (the case in Sesotho, according to Demuth, 1992, p. 600), or the two types of agreement emerge simultaneously (this is apparently what happens in West Greenlandic (Fortescue and Olsen, 1992), K'iche' Maya (Pye, 1992), Walpiri (Bavin, 1992), and Georgian (Imedadze and Tuite, 1992). There appear to be no languages in which object agreement is acquired before subject agreement.

Turning now to case drop, if in fact the computational demands associated with keeping track of the more distant verb–subject relation make it worthwhile to retain case on the subject while permitting its suppression on the direct object, we would expect this contrast to be evident in the course of linguistic development. This seems to be right: Suzuki (1999) reports that children learning Japanese exhibit an overwhelming greater tendency to have a case marker on the subject than on the direct object, even though they sometimes use the wrong case form (see also Lakshmanan and Ozeki, 1996; Miyata, 1993). Moreover, as noted in the preceding section, Kanno (1996) reports that the same tendency is strongly manifested in adult second language learners, even when there is no relevant experience or instruction.

5 Conclusion

Reduced to its essentials, the study of language is centered on the investigation of two very fundamental questions – why language is the way it is, and how it is acquired. To date, the most detailed answer to these questions has come from proponents of grammatical nativism, who have put forward a theory that simultaneously addresses both questions: Universal Grammar determines the properties that any human language must have and, by virtue of being inborn, it helps explain the success and rapidity of the language acquisition process.

A defining feature of UG-based theories is their commitment to hierarchically structured symbolic representations. Not only are the key properties of language defined in terms of these representations, but the mechanisms determining a sentence's pronunciation and interpretation are thought to make crucial reference to them as well. On this view, then, the end point of the language acquisition process can be seen, in part at least, as the ability to associate such representations with the sentences of one's language.

At the other extreme, recent work in connectionism denies the existence of conventional syntactic representations, of Universal Grammar, and of an inborn acquisition device specifically for language. Language acquisition, it is claimed, is not fundamentally different from any other type of learning and can be accounted for by the same mechanisms as are required for interaction with the environment in general.

My own work has been exploring a radical idea of a different sort. As I have characterized it, general (or cognitive) nativism differs from connectionism in being committed to the existence of hierarchically structured symbolic

representations as part of a theory of why language is the way it is and to the existence of an inborn acquisition device as part of a theory of how language is acquired. At the same time, it differs from grammatical nativism in not positing inborn categories or principles that are exclusively grammatical in character.

Differences as deep as these are unlikely to be resolved immediately, but the challenge is at least clear – we need a viable account both of the properties that define human language and of the acquisition of individual languages on the basis of very limited types of input. There is surely a place for the study of second language acquisition in all of this. At the very least, research on second language learning provides opportunities to observe the acquisition device functioning under conditions of duress – either because of extreme limitations on the available input (as in the case of classroom learning) or because one or more of its component modules have been compromised, or both. It is perhaps not too optimistic to think that the further study of this phenomenon will provide opportunities to extend and deepen our understanding of the acquisition device for human language.

NOTES

1 When we add three or more numbers (e.g., 7 + 4 + 8), we always proceed in a pair-wise fashion; no one is able to compute all the numbers in a single step.

2 As predicted, direct object relatives are known to be easier than indirect object relatives, in both first language acquisition (de Villiers, Tager Flusberb, Hakuata, and Cohen, 1979; Hildebrand, 1987) and second language acquisition (Gass, 1979; Wolfe-Quintero, 1992). However, depth of embedding cannot account for the relative preference for preposition stranding over "pied-piping" found in children learning English as a first language (e.g., McDaniel, McKee, and Bernstein, 1998) and, possibly, in second language learners too (White, 1989, pp. 122ff):

   i *Preposition stranding: three intervening nodes:*
   the man who [$_{S}$ you [$_{VP}$ talked [$_{PP}$ to _]]]

   ii *Pied-piping: two intervening nodes:*
   the man to whom [$_{S}$ you [$_{VP}$ talked _]]

   The obvious explanation for this contrast is simply that the pied-piped structure is all but non-existent in the input. But this raises the question of why English is this way, given the general tendency in human language to avoid preposition stranding. J. Hawkins (1999) makes an interesting proposal in this regard, but space does not permit further discussion of this matter here.

3 The same should be true of wh-questions as well, and there do in fact appear to be some languages in which only subjects undergo *wh*-movement (Cheng, 1991).

4 The Minimalist Program still falls well short of being general nativist, however. Chomsky (1995) makes a number of proposals with a strong special nativist character, including a property "P" that permits multiple

nominative patterns in Japanese by allowing a feature to remain active even after being checked and deleted (p. 286) and a parameter that licenses multiple subject constructions in Icelandic by permitting an unforced violation of Procrastinate (p. 375).

5 As illustrated in the syntactic representation for VSO languages, the computational system I adopt permits discontinuous constituents. For extensive discussion, see O'Grady (2001b).

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