Language acquisition without Universal Grammar: a general nativist proposal for L2 learning

William O'Grady

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Language acquisition without Universal Grammar: a general nativist proposal for L2 learning

William O'Grady *University of Hawai'i at Mānoa*

This article explores the prospects for a 'general nativist' theory of first and second language acquisition. A modular acquisition device that does not include Universal Grammar (UG) is outlined and its role in the emergence of an L1 is considered. The relevance of this proposal for a theory of SLA is then explored, leading to the suggestion that the properties and outcome typical of postadolescent L2 learning can be traced to the fact that adults have only partial access to the L1 acquisition device.

I Introduction

A major issue in the contemporary study of SLA revolves around the question of whether the cognitive mechanisms involved in L1 acquisition are available, in whole or in part, to adults learning an L2. This question is commonly formulated in terms of Universal Grammar (UG), the inborn system of linguistic categories and principles that proponents of Government and Binding (GB) theory and its derivatives take to make up the core of the L1 acquisition device. Thus, the key issue for many SLA researchers becomes: to what extent is UG available to adult L2 learners?

The purpose of this article is to question the premise on which this research programme is built (namely, that the L1 acquisition device includes UG) and to consider the consequences of an alternative conception of L1 learning for the study of SLA. The particular perspective on L1 acquisition that I adopt here is based on the idea that the genetic endowment for human language does not include syntactic categories or principles *per se* – a view that can be referred to as 'general nativism', in contrast with the more traditional view that there is an innate *grammatical* system ('special nativism').

I will begin my discussion of these matters by briefly outlining the general nativist view of L1 acquisition that I have developed in much more detail in other work. I will then illustrate its functioning

Address for correspondence: Department of Linguistics, University of Hawai'i at Mānoa, Honolulu, HI 96822, USA.

by considering how it contributes to the development of a sentence-building system for English. I will focus my remarks on the operation of the computational mechanisms responsible for the 'architecture' of syntactic representations and for the interpretation of reflexive pronouns that occur within those representations. In the third part of this article, I will turn my attention to SLA and will examine the possibility that the general nativist acquisition device underlies this sort of linguistic development as well.

II General nativism

The version of general nativism that I advocate differs from most other alternatives to UG in at least two respects. First, it assumes that the end product of the language acquisition process is a formal grammar. In contrast, the vast majority of work on alternatives to UG either rejects the existence of a formal grammar in favour of a semantically based syntax (e.g., Schlesinger, 1982) or remains silent on what this grammar looks like (e.g., Slobin, 1985).

Secondly, in the version of general nativism that I propose, there is relatively little room for learning in the conventional sense: as noted in more detail below, the grammar that is the end point of the language acquisition process is for the most part derived from inborn notions and mechanisms. My views thus contrast with the radical inductivist perspective put forward by Derwing (1973: 201), Maratsos and Chalkley (1981), and Braine (1987) as well as with the 'connectionist' view espoused in MacWhinney and Bates (1989), both of which look to experience as the principal source of syntactic knowledge.

Earlier work of mine on general nativism vacillated somewhat over precisely what this approach to language acquisition entails. In retrospect, one can see that two separate claims were at stake (see, e.g., O'Grady, 1987: 181): the very strong proposition that the categories and principles needed for language acquisition are all independently attested outside language and the weaker view that these categories and principles are not grammatical (i.e., 'syntactic') in the conventional sense. Both claims entail that there is no inborn UG (i.e., no innate grammatical system), but only the latter claim leaves open the possibilility that linguistic development might draw on (nonsyntactic) concepts or mechanisms that are not manifested outside 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: 193). Although some very central components of the acquisition device are indeed manifested outside the language faculty, some are apparently peculiar to language (e.g.,

particular notions high in 'grammaticizability', something like the Subset Principle, and so on; see below for further discussion). Crucially, however, the acquisition device does not include conventional syntactic notions ('noun', 'subject', etc.) or principles such as Principle A ('An anaphor must be bound in some domain') or the Empty Category Principle ('An empty category must be properly governed').

Interestingly, recent work within the 'Minimalist Program' that has grown out of GB theory (e.g., Chomsky, 1995) suggests that UG as it was conventionally understood is being abandoned even by those traditionally committed to special nativism in its strongest form. The latest generation of proposed explanatory principles focuses on the notion of economy, demanding 'short moves' that are postponed for as long as possible ('Procrastinate') and that take place only to satisfy requirements of the moved element itself ('Greed'). While one might argue that such computational principles are by definition 'grammatical' (since they account for grammatical facts), they are clearly very unlike the inventory of principles making up the sort of UG posited in the first 35 years of work in the special nativist tradition.

It may well be, then, that future research on the acquisition device will focus not on whether there are inborn 'grammatical' principles (there are not), but rather on what the right computational principles are, what types of representations and operations they apply to, and whether at least some of these principles might be manifested outside language. In the remainder of this article, I will make a series of proposals regarding these issues that has grown out of my recent work within the general nativist tradition.

1 The syntax

For the purposes of this exposition, it is useful to divide the syntax of a language into three components whose existence and general character is a matter of near-consensus in the field. The first and arguably most basic of these components consists of a small inventory of syntactic categories (N, V, etc.) to which the words of a language are assigned. I will have nothing more to say about syntactic categories here, but see O'Grady (1996a; 1996b) for extensive discussion of their character and development.

A second component of the adult grammar includes a set of structure-building mechanisms that combine words into larger phrases and ultimately sentences. In accordance with the widely

held view, I assume that the syntactic structures produced by these mechanisms meet three conditions: 1) every word and phrase is assigned to a syntactic category; 2) all 'branching' is binary; and 3) there is a 'subject–object asymmetry' in that a verb is structurally 'closer' to its direct object than to its subject. The syntactic representation in (1) (Figure 1) exemplifies a structure that meets these conditions. (The symbol X takes the place of the various category labels.)

1)

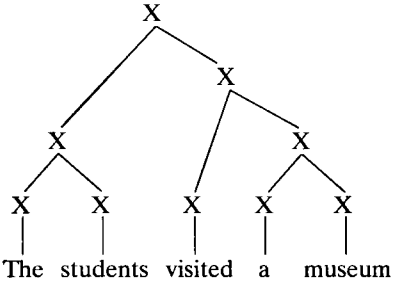


Figure 1

The third and final component of syntactic knowledge assumed here consists of the principles that regulate phenomena such as pronoun interpretation (the 'binding' principles) and the relationship between a 'gap' and the 'displaced' element with which it is associated ('island' constraints). Following the orthodox view, I assume that these principles make reference to categorial and configurational features of syntactic structure.

2 The acquisition device

The general nativist acquisition device that I have proposed for L1 acquisition in recent work (O'Grady, 1991; 1996a; 1996b) consists of the several independent modules summarized in Table 1. The first three modules are primarily responsible for providing the learner with a set of form-meaning pairs on which the other modules can operate. In particular, the perceptual module is responsible for representing an utterance's auditory form (providing a sort of 'phonetic transcription') while the propositional and conceptual modules together produce a representation of the utterance's meaning that includes information about predicate–argument relations as well as the 'values' for grammatically relevant

Table 1 The general nativist acquisition device

Module	Function
Perceptual	provides a means of dealing with the auditory stimulus
Propositional	provides a representation of propositional meaning in terms of predicate calculus
Conceptual	provides an inventory of notions relevant to grammatical contrasts: past-nonpast, definite-indefinite, singular-plural, ballistic-accompanied motion, etc.*
Computational	provides the means to carry out combinatorial operations
Learning	provides the means to formulate and test hypotheses

Note:
*There is of course no definitive list of notions that the conceptual system makes available to the acquisition device, although various proposals have been made – ranging from early work in descriptive linguistics by Nida (1946: 166ff) to recent proposals in language acquisition research by Bowerman (1985), Slobin (1985) and Pinker (1989), among others.

2) [Harry builds houses.] ← *phonetic representation (from the perceptual module)*

PREDICATE:	BUILD <agent, theme>	
TENSE:	non-past	
agent:	[HARRY] [singular]	← *semantic representation (producedby the propositional and conceptual modules)*
theme:	[HOUSES] [plural]	

Figure 2

semantic contrasts such as past-nonpast and definite-indefinite (Figure 2).

Because these representations contain no syntactic labels or phrasal constituents, there is no reason to think that the propositional and conceptual modules from which they are derived

include innate *syntactic* knowledge. Rather, it is widely assumed that such representations reflect the inborn architecture of cognition that exists independent of language. This is true not only for the predicate concepts themselves (e.g., BUILD) but also for the thematic role labels used to classify their arguments. For example, Jackendoff (1976: 149) proposes that the characterization of theta roles is nonlinguistic in nature, drawing on 'the study of the innate conception of the physical world and the way in which conceptual structure generalizes to ever wider, more abstract domains'. It is unclear whether the grammatically relevant contrasts provided by the conceptual module have nonlinguistic relevance in the sense of being used for the analysis of experience independent of language. Pinker (1989: 359) argues that in general they are not used in this way, while at the same time noting that they also are not syntactic in character either and that they may overlap with the notions required for other types of cognition. This view is thus consistent with the 'weaker' version of general nativism outlined above.

As I will try to show directly, the computational module interacts with the information provided in form-meaning mappings such as Figure 2 to yield syntactic representations with the appropriate architecture (binary branching, a subject–object asymmetry and so forth). Those few aspects of a sentence's organization that are not determined by innate properties of the computational module (e.g., word order) are left for the learning module to deal with. Following the standard view (e.g., Pinker, 1989: 166), I take the principal mechanism of the learning module to be hypothesis formation, subject to contraints whose status I will discuss below.

3 The architecture of syntactic structure

The computational module has at least the following innately specified properties:

3) *binarity*: its operations apply to pairs of elements.
iterativity: its operations can reapply without definite limit.
inheritability: operations that cannot apply at one level are carried up to the next.

The binarity property ensures that syntactic representations are formed by combining pairs of elements, in accordance with the widely held view (e.g., Kayne, 1983: 227n; Bach, 1988: 22; Larson, 1988: 381). The inheritability and iterativity properties permit the inheritance of unsatisfied dependencies and the repeated

application of the combinatorial operation needed to satisfy them.[1]

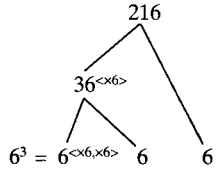
To see how this works, we need to assume that independent developments in the acquisition process produce at least a partial lexicon, consisting of an inventory of words that have been paired with information about their category membership and argument dependencies. (The precise manner in which this takes place is outlined in O'Grady, 1996a; 1996b).) N = nominal category and V = verbal category; argument dependencies are written in angle brackets:

4) A fragment of the English lexicon:
Harry: N
house: N
left: $V^{<N>}$
fall: $V^{<N>}$
build: $V^{<N,N>}$

Consider now how the acquisition device might react to a sentence such as *Harry builds houses*, whose phonetic and semantic representations are given in (2) above. Because of the (innate) binarity property of the computational module, the transitive verb *build* can combine with only one of its arguments at a time. The inheritability and iterativity properties (also inborn) allow the remaining dependency to be passed up to the resulting phrase and to be satisfied by subsequent combination with an appropriate argument, yielding the structure depicted in (5) (Figure 3).

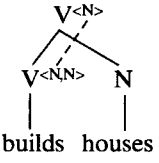
Within these representations, categories lack the familiar 'bar-

[1] Binarity, inheritability and iterativity all appear to be manifested in arithmetical computation as well. The effects of binarity are easily discerned in how we add strings of numbers (e.g., 6 + 9 + 7) – by a series of pairwise operations. A more involved example involves the cubing operation, which requires a number to be multiplied by itself twice. Given binarity, these operations must take place in separate steps, with the second multiplication operation being inherited upward:



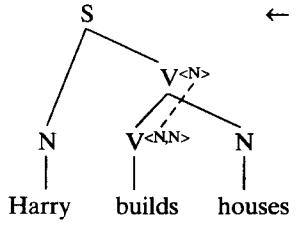
Of course, none of this is meant to imply that children are capable of doing arithmetic at the point when they start to combine words to form phrases. Among other things, arithmetical ability requires an understanding of the notion of 'number', which is not required for sentence formation. The point here is simply that certain properties of the computational operations employed by language are not unique to that cognitive domain and are (eventually) manifested in other areas.

5) STEP 1:



← first combinatorial operation: satisfaction of one dependency; inheritance of the second dependency

STEP 2:



← second combinatorial operation: satisfaction of the second dependency

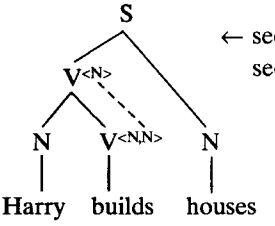
Figure 3

level' designations of more traditional work and S is treated as a 'projection' of V rather than the more abstract category I (inflection). A similar practice is common in various widely used theories, including versions of categorial grammar and head-driven phrase structure grammar. Crucially, the proposed representations comply with the common view that syntactic structure consists of words and phrases belonging to various category types, that it has binary branching and that it exhibits a subject–object asymmetry, with the verb structurally 'closer' to the object than to the subject. (The Appendix illustrates how the combinatorial system assumed here can build more complicated structures.)

As things now stand, the computational module determines the architecture of syntactic structure almost completely, leaving only one detail (other than word order) to the learner. In particular, it must be determined which argument the verb should combine with first – the one to the right (the theme), as in (5), or the one to the left (the agent), which would yield the illicit representation depicted in (6) (Figure 4).

How can this information be inferred? One possibility is that the learning module of the acquisition device forms a generalization based on the simple two-word sentences illustrated in (7) (Figure 5). Sentence formation in such cases is maximally simple since an

6)

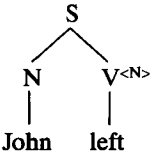


← second combinatorial operation: satisfaction of the second dependency

← first combinatorial operation: satisfaction of one dependency; inheritance of the unsatisfied dependency

Figure 4

7) a.



b.

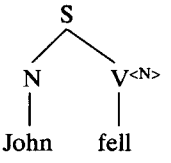


Figure 5

intransitive verb combines with a single argument, whose relative positioning can easily be determined from experience. This allows formulation of the following generalization:

8) A $V^{<N>}$ combines with an argument to its left.

Given (8), it follows that sentences built around a transitive verb must have the structure in (5), in which the $V^{<N>}$ (the phrase *builds houses*) combine with the N to its left, creating a structure in which the agent argument is more prominent than the theme.[2] This yields a plausible initial grammar for simple English sentences and will suffice for now. The Appendix outlines a more extended version of this type of sentence-building system.

4 The c-command requirement

Now consider the requirement (known as Principle A in UG-based theories) that ensures that reflexive pronouns must have 'higher' antecedents – as illustrated in (9):

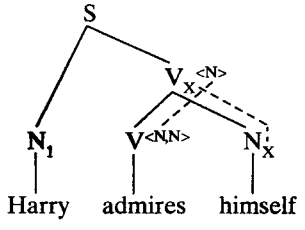
9) a. $Harry_i$ admires $himself_i$.
b. *$Harry's_i$ sister admires $himself_i$.
c. *$Himself_i$ admires $Harry_i$.

[2] Within categorial grammar, any category – word or phrase – that requires a single argument counts as intransitive. Thus *builds houses*, which is missing only an agent argument, is an instance of an intransitive verbal category (a $V^{<N>}$).

I make two assumptions here. First, I take the position that a reflexive pronoun introduces a type of 'interpretive dependency' in that it must look to another element for the determination of its reference. Secondly, I assume that the computational module of the acquisition device includes a requirement to the effect that 'dependencies' are satisfied by combination,[3] a requirement whose importance will become evident shortly.

Consider now the syntactic representation of the acceptable sentence in (9a), with the subscript 'x' representing the interpretive dependency associated with the reflexive pronoun (Figure 6). Here the verb *admire* combines first with the argument to its right (*himself*). This combinatorial relation satisfies one of the verb's argument dependencies, but it does not satisfy the reflexive pronoun's interpretive dependency. (Dependencies can only be satisfied by combination, and the verb with which *himself* combines does not include a referential index capable of supplying the reference of *himself*.) The interpretive dependency is therefore inherited, along with the verb's dependency on a second argument. Both dependencies are then satisfied by combination with the

10)

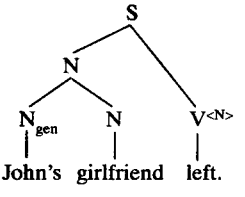


← inheritance of unsatisfied dependencies

Figure 6

[3] This requirement has in fact been tacitly assumed throughout our discussion, as can be seen by considering a simple sentence such as the following (let us assume that a genitive combines with a nominal argument to its right):

i)



Here it is clear that the agent argument dependency associated with *leave* can only be satisfied by the nominal with which it combines (*John's girlfriend*) and not by the nominal *John*. (This is why the sentence means what it does rather than, say, 'John, who has a girlfriend, left'.)

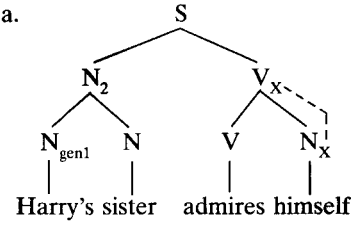
nominal *Harry*, which is thereby interpreted both as the verb's agent argument and as the antecedent for the reflexive pronoun.

Now consider the syntactic representations for the ill-formed utterances in (9b) and (c). (To keep the representations maximally simple, argument dependencies are not overtly represented here.) In (11a) (Figure 7), the interpretive dependency associated with the reflexive pronoun is once again inherited by the verbal phrase *admires himself*. However, it cannot subsequently be satisifed by the nominal *Harry's sister*, with which the verb phrase combines, because of the gender conflict. And it cannot be satisfied by the genitive *Harry* either, since the verb phrase does not combine with this element. (Recall, as noted above, that the computational module of the acquisition device allows dependencies to be satisfied only by combination.) The interpretive dependency associated with the reflexive pronoun is thus never satisfied and the sentence is anomalous.

Matters are somewhat different in (11b) (Figure 7). Here, the reflexive pronoun is in subject position and combines only with the verb phrase *admires Harry*. Since this phrase does not bear a referential index (the index on *Harry* does not introduce a dependency and therefore is not inherited by the verbal phrase), the interpretive dependency introduced by the reflexive pronoun goes unsatisfied – resulting in an ungrammatical sentence.

The end result is that reflexive pronouns always take a higher (i.e., 'c-commanding') NP as their antecedent.[4] However, this result is not stipulated by a principle of UG (such as Principle A). Rather, it follows from more basic facts – in particular, the fact that reflexive

11) a.



b.

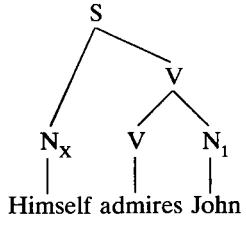


Figure 7

[4] This proposal involves the sort of 'feature-passing' analysis common in work on generalized phrase structure grammar (e.g., Kang, 1988).

Notice that I have said nothing about the 'locality requirement' – the part of Principle A that ensures that reflexive pronouns in English have a clausemate antecedent. This requirement is not universal (it does not hold in Japanese or Korean, for example, where 'long-distance' binding is routine), and I treat it as the product of the learning module rather than an innate computational property. See O'Grady (1996a) for a more specific proposal.

pronouns introduce interpretive dependencies and the fact that dependencies must be satisfied by combination.

Summary: The general nativist acquisition device that I have outlined consists of several independent modules, none of which contains information that is specifically syntactic in character. As the examples discussed in sections II.3 and II.4 help illustrate, the interaction of these modules gives a sentence-building system capable of forming syntactic representations that have the appropriate architecture (i.e., binary branching with a subject-object asymmetry); in addition, it offers a straightforward account of the 'c-command requirement' on the interpretation of reflexive pronouns.

Although the proposed acquisition device does not include UG, I do not claim that the properties of sentence structure are somehow discovered in experience, as might be suggested in an empiricist (i.e., non-nativist) theory. Quite to the contrary, the geometry of syntactic representations follows largely from inborn principles and properties (e.g., binarity, iterativity). Very little must be learnt and the role of experience is limited to providing information about the meanings and argument dependencies of individual words and to supplying data about the relative ordering of constituents – all of which is necessary in any case.

Now let us consider the possible relevance of these proposals for the investigation of SLA.

III Second language acquisition

I take the view that the general nativist acquisition device outlined above is responsible not only for L1 acquisition but also for whatever success is achieved by adult L2 learners. In particular, I propose that in general only certain modules of the acquisition device remain fully active and intact into the adult years and that deterioration to varying degrees in the remaining modules is responsible for the 'profile' peculiar to SLA (i.e., lack of uniform success, variation in ultimate attainment, fossilization, the need for instruction and so on). Let us refer to this proposal as the 'Partial Access Hypothesis':

12) The Partial Access Hypothesis
Adults have access to only part of the L1 acquisition device.

I will now attempt to make this idea more precise by considering the status in SLA of each of the modules of the general nativist acquisition device sketched above.

1 The perceptual module

The perceptual module regulates the inventory of phonetic distinctions relevant for phonemic contrasts in human language (e.g., Eimas, 1974), the set of natural processes that can influence the articulation and perception of sounds in context (Stampe, 1973), and sensitivity to cues that are helpful for segmenting the speech stream into smaller morpheme- and word-sized chunks (Peters, 1983; Peters and Menn, 1993).

The perceptual module seems to function best during a 'sensitive period' that ends around the age of 6 for many learners: language acquired after that point typically suffers from a 'foreign accent' (e.g., Long, 1990: 266), suggesting a reduced ability to produce (and, in some cases at least, to perceive) the subtle phonetic contrasts that underlie the phonology of any human language. A less investigated consequence of the deterioration of the perceptual module is manifested in a general insensitivity to the phonetic clues that are used for segmentation. A familiar experience among L2 learners is the inability to extract morphemes and words from the speech stream, especially in sentences that are spoken at normal speed by native speakers (see, e.g., Kelch, 1985; Griffiths, 1992, for some discussion).

2 The propositional module

As noted in Table 1, the propositional module is responsible for the representation and analysis of propositional meaning, which is a prerequisite for even the most rudimentary forms of language and reasoning. Consistent with the illustration given in (2) above, I assume that this module contributes to the formation of semantic representations by analysing propositions in terms of a predicate and a set of associated arguments. (In the case of the proposition associated with the sentence *Harry builds houses*, for example, the predicate is 'build', which takes 'Harry' as its agent argument and 'houses' as its theme argument.)

I know of no reason to think that the ability to form and represent propositions is in any way diminished in adults. I will therefore assume that the propositional module of the acquisition device remains intact and active even after the L1 acquisition process has ended.

3 The computational module

As explained in section II.3, the computational module regulates the combinatorial operations responsible for sentence formation, accounting for the binarity, iterativity and inheritability properties illustrated in earlier discussion. All three properties seem to be intact in adult L2 learners.

There is no reason to think that adults do not form L2 syntactic representations that include a binary architecture. In fact, since the computations involved in producing ternary or quaternary branching are arguably more demanding than those required for binary branching, it seems counterintuitive to suppose that they would be exploited in speaking an L2 but not in using one's native language.

Moreover, it seems clear that the iterativity and inheritability properties are still active: without them, the system of sentence formation would lose its recursive character, and it would be impossible to form sentences in which a predicate requires two or more arguments (e.g., a sentence containing a transitive or ditransitive verb). Since adult learners are unquestionably able to produce sentences of this and far greater complexity in an L2, it seems plausible to think that combinatorial operations with the computational properties found in L1 acquisition remain available after adolescence.

A further indication of the survival of the computational module comes from the investigation of how reflexive pronouns are interpreted by L2 learners. Although L2 learners are known to make errors of various sorts in acquiring reflexive pronouns (see below for discussion), they consistently select c-commanding antecedents for these elements (e.g. Thomas, 1991: 232). I interpret this as an indication that they are using the same computational system as L1 learners and therefore seek to satisfy the interpretive dependency associated with a reflexive pronoun by combination. Compliance with the 'c-command requirement' thus follows automatically (see the discussion of the sentences in (9) above).

As I see it, the literature on the accessibility of UG in SLA is for the most part concerned with manifestations of the computational module, including mechanisms that I have not attempted to describe here. (This work is of course not construed in this way by its authors, but this does not matter. The findings reported in these studies say essentially nothing about the content of the principles regulating sentence formation; they bear only on the question of whether these principles – whatever they are – remain available to adult learners.)

Reviewing the literature on the accessibility to adults of grammatical principles, Bley-Vroman (1994) observes:

> Although non-native judgement patterns are definitely better than chance, they are far from perfect and far from native speaker accuracy. The cumulative effect is such that one can almost guarantee that any study of the accessibility of UG in SLA will come up with non-natives better than chance, less than 'perfect'.

Although this might seem to suggest diminished access to the computational module, a less pessimistic view is adopted by Uziel (1993), who argues that any indication that learners perform above the level of chance on contrasts reflecting computational principles should be interpreted as evidence for access to those principles – a not unreasonable proposal in the light of the many extraneous factors (e.g. attention and processing limitations, vocabulary deficits, nervousness and so forth) that can interfere with performance in experimental settings. Interestingly, recent work by Kanno (1996; 1997) that has managed to test for access to computational principles using very simple sentences has yielded results for adult learners of Japanese that are not significantly different from those for native speakers.

4 The conceptual module

The function of the conceptual module is to provide the 'vocabulary' of notions in terms of which a language's key grammatical and lexical contrasts are formulated. Some of these notions are apparently quite transparent (e.g., the singular–plural contrast[5]), while others are virtually unfathomable to those not exposed to the system as children (e.g., the *the/a* distinction in English).

The evidence suggests that the contents of the conceptual module are (at best) partly available to adult L2 learners. This leaves them unable ever to identify and control fully the contrasts on which many lexical and grammatical contrasts turn. For example, Coppetiers (1987) reports that even highly proficient non-native speakers of French differ from native speakers with respect to contrasts involving such phenomena as choice of tense and aspect, adjective position, article use, and the like.

The effects of this deficit also show up in phenomena involving

[5] In fact, I think this is a gross simplication. As demonstrated by Hirtle (1982) and Wickens (1991), the noun affix *-s* in English encodes a contrast far subtler than singular-plural.

argument structure alternations. Consider, for example, the following contrasts:

13) a. I sent Howard the package.
b. *I sent Harvard the package. (cf. I sent the package to Harvard)

14) a. I threw/tossed Harry the ball.
b. *I pushed/dragged/shoved Harry the trunk.

In the theory proposed by Pinker (1989), the first pair of sentences illustrates a 'broad-range' constraint requiring that the double object pattern be reserved for sentences denoting a transfer whose end point is a potential 'possessor' or recipient (e.g., Howard) versus one that is simply a 'location' (e.g., Harvard). The second pair of sentences shows the effects of a 'narrow-range' constraint that licenses the double object pattern for predicates denoting ballistic motion (*throw, toss*, etc.) but not for those designating 'accompanied motion' (*push, drag* and so on).

In a series of experiments involving adult Japanese speakers learning English, Yoshinaga (1991) found that whereas the L2 learners respected the broad-range constraint as strongly as native English speakers, they exhibited a far weaker sensitivity to the 'narrow-range' constraint.[6] (In fact, some of the L2 learners were completely oblivious to this constraint.) Following Bley-Vroman and Yoshinaga (1992), I interpret these results as evidence that adults do not have access to the full inventory of notions that the conceptual module makes available to L1 learners.

This conclusion does not necessarily contradict the widely held view that adults are conceptually more sophisticated than children. Indeed, the inaccessibility of particular notions to adult L2 learners may well result from the *richness* of their conceptual inventories (see Felix, 1987: 161ff; Newport, 1990: 22, for parallel views with regards to other SLA phenomena). Imagine, for example, that the set of contrasts provided by the conceptual module of the L1 acquisition device is initially 'partitioned' off from whatever other notions are available to children. With maturation, this partitioning might collapse, allowing those concepts that are high in potential grammatical relevance to mingle with the larger conceptual inventory (or inventories) of 'general intelligence'. Under such circumstances, finding the notion underlying a particular grammatical contrast in an L2 might resemble the proverbial search

[6] Inagaki (1994) found that native speakers of Chinese and Japanese make no distinction between the *throw*-class and the *push*-class, but that they do differentiate the *tell*-class from the *whisper*-class. Evidence for possible limited sensitivity to narrow semantic classes on the part of some Japanese speakers learning English is also reported by Sawyer (1995).

for a needle in a haystack: the search space might simply have become too large.

A variant of this view is that the conceptual module maintains its integrity into adulthood but undergoes internal reorganization in response to many years of (first) language use. On this view, contrasts that are never activitated in the mapping of meaning on to form are in effect 'buried alive' within the conceptual module by those contrasts that are grammaticalized in the L1. The buried notions might still be accessible for cognitive activities other than grammar formation, but for the purposes of language acquisition they would constitute a permanent 'underclass' with little hope of ever superceding the notions that had established themselves in the course of L1 acquisition.

On both of these views, then, adult Japanese speakers have access to notions such as 'ballistic' and 'accompanied motion', but this is of little use to them when it comes to learning the grammar of double object patterns in English. This is because these notions have either been submerged in an ocean of other concepts (if partitioning is lost) or have been become suppressed (if there is internal reorganization of the conceptual module during L1 acquisition).

5 The learning module

As noted earlier, I assume that learning involves a process of hypothesis formation and testing. As Pinker (1989: 166–67) remarks: 'Despite its many guises, learning can always be analyzed as a set of "hypotheses" the organism is capable of entertaining and of a "confirmation function" by which environmental input tells the organism which one to keep' (see also Fodor, 1975: 95).

There is no reason to think that the ability to form hypotheses is in any way diminished in adults. In fact, if anything, the mature mind can produce more intricate hypotheses than is possible in childhood. However, hypothesis formation in adult language learning arguably differs from the corresponding process in L1 acquisition in at least one crucial respect: it fails to obey what I will call the Conservatism Law (see White, 1989: 148ff for a similar observation within a UG-based framework):

15) The Conservatism Law[7]
The acquisition device formulates the most conservative hypothesis consistent with experience.

[7] A similar constraint is embodied in the 'Limited Functions' operating principle of Slobin (1985: 1199) and, of course, the Subset Principle of Berwick (1985: 37) and Wexler and Manzini (1987). See also Pinker (1989: 317ff).

The loss of the Conservatism Law is not always easy to discern. For example, it is well known that adults learning English generally show a preference for the more 'local' antecedent in sentences such as the following, even if their native language (e.g., Japanese, Korean or Chinese) allows a reflexive pronoun to be coreferential with the more distant NP as well (see, e.g., Hirakawa, 1990; Finer, 1991; Thomas, 1991):

16) Harry thinks that [John admires himself]

However, the performance of L2 learners on these patterns may not be as impressive as it initially appears. Only 10 of 65 subjects in Hirakawa's study responded correctly to all patterns of this type (1990: 78), and Thomas's finding that about 80% of Japanese native speakers 'consistently' select local antecedents in English biclausal sentences must be tempered by the fact that the criterion for success was only 66% (1991: 228).[8] Moreover, in an earlier study of 29 Spanish speakers learning English, Thomas (1989: 292) reports that her subjects linked the reflexive pronoun to a local antecedent only 60% of the time, even though their native language also requires a clausemate antecedent for reflexive pronouns.

A further problem with studies of reflexive pronoun interpretation in biclausal sentences is that there are independent processing reasons why a local antecedent might be preferred (it is in the same clause, which is a natural unit of processing). An arguably more appropriate test case for conservatism involves English native speakers' interpretation of Japanese sentences such as the following, in which both potential antecedents are in the same clause.

17) Yoshiko-wa Akira-ni jibun-no shashin-o mise-ta.
Yoshiko-TOP Akira-DAT self-GEN picture-AC show-PST
'Yoshiko showed Akira self's picture.'

Here, Japanese allows only the subject to serve as antecedent for the reflexive pronoun, but Shimura (1990: 117) and Thomas (1991: 229) report that only around half of English native speakers consistently interpreted Japanese test sentences in this way. (And even these learners interpreted many individual sentences incorrectly.) The remainder either did not respond consistently or allowed both the subject and the object to serve as antecedent, following the pattern manifested in their L1 rather than the

[8] Furthermore, as noted by Yuan (1994), Japanese has a phrasal reflexive (*kare zisin*) which (generally) requires a clausemate antecedent and which could easily provide a model for the interpretation of the English reflexives.

Conservatism Law. Although transfer can account for these particular results, they are also what we would expect if hypothesis formation in adults is not systematically subject to the Conservatism Law.

Of course, this does not mean that hypothesis formation in SLA is completely unconstrained (clearly, it isn't). The claim is simply that it may not systematically obey the Conservatism Law.[9] Other considerations (perhaps including transfer from one's L1, processing factors, previous experience with L2 learning and so on) presumably influence the hypothesis formation process.

Moreover, certain types of overly general hypotheses may be ruled out by the acquisition device in other ways. For example, it was noted earlier that L2 learners apparently have no trouble with the requirement that reflexive pronouns take a 'c-commanding' antecedent. However, on the view of SLA outlined here, this does not demonstrate the operation of either the Conservatism Law or L1 transfer. Rather, it reflects the fact that the interpretation of such elements follows from inborn properties of the computational module (see the discussion in section II.2), which is intact in adults.

IV Concluding remarks

Table 2 summarizes the view of the acquisition device in adults that I have outlined in this article. This view of the adult acquisition device can be seen as a very specific version of the following hypothesis about the nature of postadolescent L2 learning:

12) The Partial Access Hypothesis
Adults have access to only part of the L1 acquisition device.

Taking as our starting point the idea that L2 learning draws on a diminished version of the acquisition device available to children, it is relatively easy to imagine the elaboration of a research programme that would seek to address a series of questions that

[9] Although this is the position I take for the purposes of this article, I believe that the question of whether the Conservatism Law survives into adulthood is in fact still open. In ongoing work, for example, Naoko Yoshinaga (pers. comm.) has found a reticence on the part of Japanese-speaking learners of English to produce or accept multiple *wh* questions such as *Who saw why?*, which are grammatical in Japanese but not English; this could perhaps be interpreted as a manifestation of conservatism. Moreover, Hamilton (this issue) offers a perceptive review of the literature on reflexive pronoun interpretation by adult L2 learners, noting that various extraneous factors (ranging from processing to choice of lexical items) may be responsible for at least certain of the 'long-distance' responses. As noted above, however, the 'local' responses may also also be favoured by processing considerations, so the precise relevance of these findings to the Conservatism Law remains uncertain.

Table 2 The fate of the acquisition device in adulthood

Module	Status
Perceptual	significantly diminished ability to perceive and produce phonemic and subphonemic contrasts; difficulty using phonetic clues to segment the speech stream into morphemes and words
Propositional	intact
Computational	intact
Conceptual	reduced access to notions not relevant for grammatical and lexical contrasts in the L1
Learning	the ability to form generalizations and inferences, while intact and perhaps even enhanced, may no longer be systematically constrained by the Conservatism Law

this proposal raises. Is variation in the extent to which individuals retain access to (parts of) the acquisition device responsible for differences in ultimate attainment? To what extent can the loss of particular modules of the acquisition device be mitigated by alternative strategies, including 'transfer' from the L1 and attention to instruction and feedback? Are there conditions (e.g., repeated exposure to new languages throughout adolescence) under which diminution of the acquisition device can be avoided? And so on.

Although the Partial Access Hypothesis is a very preliminary and programmatic idea that leaves innumerable details to be worked out, it is not without empirical support: indeed, it seems to fit rather well with various established facts about SLA, as outlined in section III above. The Partial Access Hypothesis is also attractive conceptually, since it places L2 learning on a continuum that includes L1 acquisition, *contra* the less parsimonious view that SLA reflects the operation of an entirely different set of cognitive mechanisms (e.g. the 'Fundamental Differences Hypothesis' of Bley-Vroman, 1989). This in turn allows us to retreat only minimally from what should surely be the null hypothesis in the study of linguistic development: a single acquisition device is responsible for all language acquisition.

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V References

Bach, E. 1988: Categorial grammars as theories of language. In Oehrle, R., Bach, E. and Wheeler, D., editors, *Categorial grammars and natural language structures*, Dordrecht: Reidel, 17–34.

Berwick, R. 1985: *The acquisition of syntactic knowledge*. Cambridge, MA: MIT Press.

Bley-Vroman, R. 1989: What is the logical problem of foreign language learning? In Gass, S. and Schachter, J., editors, *Linguistic perspectives on second language acquisition*, Cambridge: Cambridge University Press, 41–68.

—— 1994: Updating the Fundamental Difference Hypothesis. Talk presented at the EURSLA convention, Aix-en-Provence.

Bley-Vroman, R. and **Yoshinaga, N.** 1992: Broad and narrow constraints on the English dative alternation: some fundamental differences between native speakers and foreign language learners. *University of Hawai'i Working Papers in ESL* 11, 157–99.

Bowerman, M. 1985: What shapes children's grammars? In Slobin, D., editor, *The crosslinguistic study of language acquisition. Vol. 2. Theoretical issues*, Hillsdale, NJ: Lawrence Erlbaum Associates, 1257–1314.

Braine, M. 1987: What is learned in acquiring word classes – a step toward an acquisition theory. In MacWhinney, B., editor, *Mechanisms of language acquisition*, New York: Lawrence Erlbaum Associates, 65–87.

Chomsky, N. 1995: *The Minimalist Program*. Cambridge, MA: MIT Press.

Coppetiers, R. 1987: Competence differences between native and non-native speakers. *Language* 63, 544–73.

Derwing, B. 1973: *Transformational grammar as a theory of language acquisition,* New York: Cambridge University Press.

Eimas, P. 1974: Linguistic processing of speech by young infants. In Schiefelbusch, R. and Lloyd, L., editors, *Language perspectives – acquisition, retardation and intervention*, Baltimore, MD: University Park Press, 55–73.

Felix, S. 1987: *Cognition and language growth*, Dordrecht: Foris.

Finer, D. 1991: Binding parameters in second language acquisition. In Eubank, L., editor, *Point/counterpoint: Universal Grammar in the second language*, Philadelphia, PA: John Benjamins, 351–74.

Fodor, J. 1975: *The language of thought*. New York: Crowell.

Griffiths, R. 1992: Speech rate and listening comprehension: further evidence of the relationship. *TESOL Quarterly* 26, 385–90.

Hirakawa, M. 1990: A study of the L2 acquisition of English reflexives. *Second Language Research* 6, 60–85.

Hirtle, W. 1982: *Number and inner space: A study of grammatical number in English*. Quebec: Presses de l'Université Laval.

Inagaki, S. 1994: The acquisition of narrow-range rules for the dative alternation in English by Japanese and Chinese adults learners of English. Scholarly paper. Department of ESL, University of Hawai'i.

Jackendoff, R. 1976: Toward an explanatory semantic representation. *Linguistic Inquiry* 7, 89–150.

Kang, B. 1988: Unbounded reflexives. *Linguistics and Philosophy* 11, 415–56.

Kanno, K. 1996: Access to Universal Grammar in second language acquisition: data from the interpretation of null arguments in Japanese. *Linguistics*, in press.

—— 1997: The status of a non-parametrized principle in the L2 initial state. *Language Acquisition*, in preparation.

Kayne, R. 1983: Connectedness. *Linguistic Inquiry* 14, 223–50.

Kelch, K. 1985: Modified input as an aid to comprehension. *Studies in Second Language Acquisition* 7, 81–90.

Larson, R. 1988: On the double object construction. *Linguistic Inquiry* 19, 335–92.

Long, M. 1990: Maturational constraints on language development. *Studies in Second Language Acquisition* 12, 251–85.

MacWhinney, B. and **Bates, E.,** editors, 1989: *The crosslinguistic study of sentence processing*. Cambridge: Cambridge University Press.

Maratsos, M. and **Chalkley, M.** 1981: The internal language of children's syntax: the ontogenesis and representation of syntactic categories. In Nelson, K., editor, *Children's language. Volume 2*, New York: Gardner Press, 127–214.

Newport, E. 1990: Maturational constraints on language learning. *Cognitive Science* 14, 11–28.

Nida, E. 1946: *Morphology: the descriptive analysis of words*. Ann Arbor, MI: University of Michigan Press.

O'Grady, W. 1987: *Principles of grammar and learning*. Chicago, IL: University of Chicago Press.

O'Grady, W. 1991: *Categories and case: the sentence structure of Korean*. Philadelphia, PA and Amsterdam: John Benjamins.

—— 1996a: *Syntactic development*. Chicago: University of Chicago Press (in press).

—— 1996b: The acquisition of syntactic representations: a general nativist approach. In Ritchie, W. and Bhatia, T., editors, *Handbook of language acquisition*, New York: Academic Press (in press).

Peters, A. 1983: *The units of language acquisition*. New York: Cambridge University Press.

Peters, A. and **Menn, L.** 1993: False starts and filler syllables: ways to learn grammatical morphemes. *Language* 69, 742–77.

Pinker, S. 989: *Learnability and cognition: the acquisition of argument structure*. Cambridge, MA: MIT Press.

Sawyer, M. 1995: Learnability, teachability, and argument structure: Adult

Japanese learners' acquisition of the English dative alternation. PhD dissertation, Department of ESL, University of Hawai'i at Mānoa.

Schlesinger, I.M. 1982: *Steps to language*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Shimura, A. 1990: Testing the availability of Universal Grammar in second language acquisition: the Governing Category Parameter and the Proper Antecedent Parameter in Japanese as a second language. MA. thesis, Department of ESL, University of Hawai'i at Mānoa.

Slobin, D. 1985: Crosslinguistic evidence for the language-making capacity. In Slobin, D., editor, *The crosslinguistic study of language acquisition. Vol. 2. Theoretical issues*, Hillsdale, NJ: Lawrence Erlbaum Associates, 1157–1256.

Stampe, D. 1973: A dissertation on natural phonology. PhD. dissertation, University of Chicago.

Thomas, M. 1989: The interpretation of English reflexive pronouns by non-native speakers. *Studies in Second Language Acquisition* 11, 281–303.

—— 1991: Universal Grammar and the interpretation of reflexives in a second language. *Language* 67, 211–39.

Uziel, S. 1993: Resetting Universal Grammar parameters: evidence from second language acquisition of Subjacency and the Empty Category Principle. *Second Language Research* 9, 49–83.

Wexler, K. and **Manzini, M.** 1987: Parameters and learnability in binding theory. In Roeper, T. and Williams, E., editors, *Parameter setting*, Dordrecht: Reidel, 41–76.

White, L. 1989: *Universal Grammar and second language acquisition*. Philadelphia, PA: John Benjamins.

Wickens, M. 1991: *Grammatical number in English nouns*. Philadelphia, PA: John Benjamins.

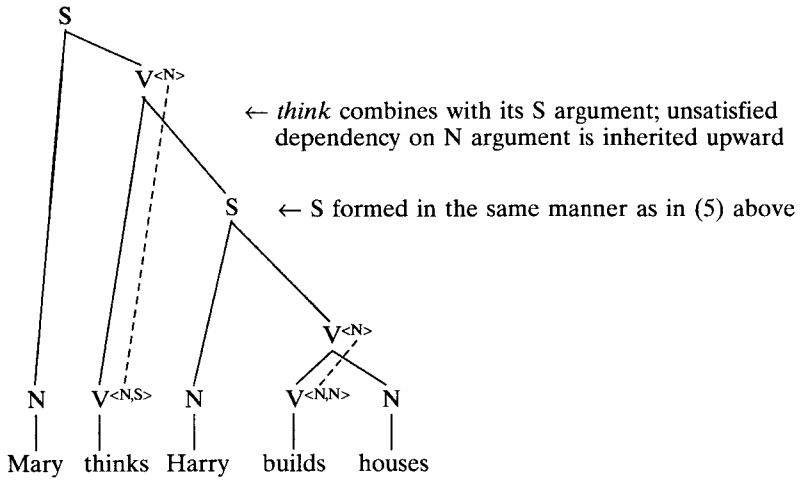
Yoshinaga, N. 1991: Acquisition of the English dative construction by the Japanese: a learnability approach to second language acquisition. MA. thesis, Department of ESL, University of Hawai'i.

Yuan, B. 1994: Second language acquisition of reflexives revisited. *Language* 70, 539–45.

Appendix

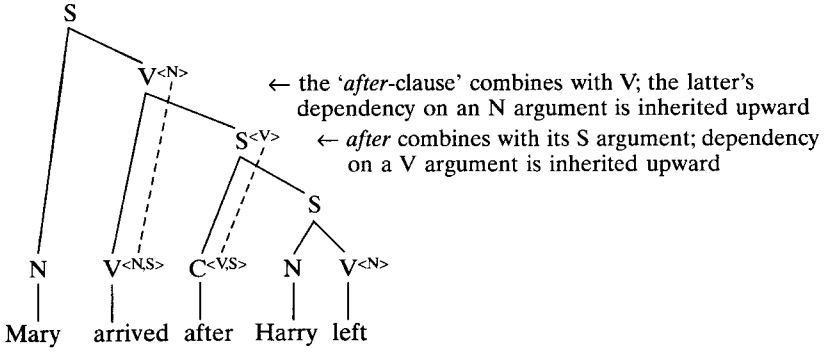
The set of structures that can be formed by the sentence-building system adopted here can be easily increased by simply expanding the lexicon. Imagine, for example, that the lexicon includes items such as *believe* and *think*, which are categories of the type $V^{<N,S>}$ – that is, verbal categories that take one sentential argument and one nominal argument. Without any revisions, the proposed combinatorial system could then build structures with one or more levels of embedding, as (i) helps illustrate:

i)



Let us further assume that the lexicon includes 'connectives' such as *after* and *when*, which can be treated as elements that take one sentential 'argument' and one verbal 'argument' (i.e., $C^{<V,S>}$, with 'C' standing for 'connective'). Then, the sentence formation system could build sentences such as the following, in which the higher verb is modified by an 'adverbial' clause:

ii)



Further additions of this type to the lexicon bring about concomitant increases in the generative capacity of the sentence-building system.