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Functionalist linguistic theory and language acquisition*

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ABSTRACT

Most theoretical work in developmental psycholinguists has been informed by ideas from formalist linguistic theories, and this paper argues that functionalist linguistic theories, in particular Role and Reference Grammar, have much to contribute to theories of language acquisition. The contrasts between formalist and functionalist linguistic theories and their differing implications for acquisition are characterized, and then specific areas of acquisition are discussed: the acquisition of tense, aspect, modality and negation, and the learning of the constraints on extraction phenomena known as 'island constraints' or 'subjacency' from evidence readily available to the child. Finally, the consequences of this account of extraction constraints for the issue of modularity are explored.

1. INTRODUCTION[1]

For the past decade or so, the debate regarding language acquisition has been primarily between those adopting a formalist perspective and focusing on issues of learnability and a hypothesized 'mental organ of language', and those taking a more functionalist perspective and emphasizing the importance of social interaction and general cognitive principles in the acquisition process. Formalist research has been informed by generative linguistic theory, primarily by Government-Binding Theory and Lexical-Functional Grammar. On the other hand, much of the work that has gone under the label of 'functionalist' in the child language and language acquisition literature has not been inspired by any particular functionalist linguistic theory but rather by a strong commitment to the view that

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meaning, use, communicative intentions and interaction are crucial to understanding language development. The purpose of this paper is to show that input from functionalist linguistic theory can play an important role in the research of functionally-oriented developmental psycholinguists and to argue that one particular functionalist theory of grammar, Role and Reference Grammar ([RRG], as developed in Foley & Van Valin (1984) [FVV] and subsequent work, especially Van Valin (1990)), is especially well-suited to the needs of acquisition researchers.

A major area of contrast between formalist and functionalist approaches to both language and acquisition concerns their conception or definition of language. Different linguistic theories have different views of the nature of human language, and the basic orientation of the study of language acquisition from a given theoretical perspective follows directly from the conception of language that underlies it, since that conception defines what the child acquires. Chomsky (1977) defines a language as 'a set of structural descriptions of sentences, where a full structural description determines (in particular) the sound and meaning of a linguistic expression' (81); that is, a language is an infinite set of formal objects of a certain type. On this definition, language acquisition involves the development of a set of rules and principles which will specify (generate) this set of formal entities. Syntax is autonomous, in Chomsky's view, and it is therefore radically arbitrary (in Saussure's sense), i.e. the rules, principles and structures are not motivated in any way by semantic, pragmatic or cognitive concerns. This hypothesized radical arbitrariness of syntax has profound consequences for the issue of acquisition. Simple lexical forms like *dog, cat,* and *tree* are radically arbitrary and must be learned as distinct individual items. It is obvious that syntax cannot be learned the same way, and yet if it is radically arbitrary, it is difficult to see how such an abstract grammatical system could be learned. This has led to the view that the general principles of grammar are given to the child in advance and that the task of the language acquirer is to ADAPT these principles to fit the data which he/she is exposed to. Aside from the lexical content of language, a child does not actually *learn* language, in particular grammar, in any sense. This will be called the ADAPTATIONIST view of language acquisition. The 'principles and parameters' conception, associated with GB theory, is the best known example of an adaptationist theory; it assumes that the child is born with the modules of GB theory and adapts them ('sets the parameters') so that they are in conformity with the language to which he/she is exposed.

If, on the other hand, the functionalist view of language as a system of communicative social action is adopted, then what the child acquires are rules and principles which relate forms and functions, functions which may be semantic, pragmatic or social and forms of behaviour which may be

linguistic and non-linguistic. Syntax is not radically arbitrary, in this view, but rather is *relatively motivated* by semantic, pragmatic and cognitive concerns. It is not completely motivated: syntax cannot be reduced to any one or a combination of these notions. There is a significant degree of arbitrariness in linguistic structure which cannot be denied, but the crucial question is, 'is the semantic and pragmatic motivation for linguistic structure which functionalist linguistic theories posit sufficient to render language learnable without postulating an autonomous language acquisition device?' This view does not deny what Chomsky has called 'the creative use of language', i.e. the capacity to generate an infinite number of sentences; rather, it seeks to analyse this creativity in the context of the speech activities in which it manifests itself.

This second perspective holds that the child actually *learns* language and CONSTRUCTS a grammar during the process of language acquisition, and consequently on this view grammar is in fact learned. This will be termed the CONSTRUCTIONIST view. It should be noted that this perspective does not entail a '*tabula rasa*, pure induction' approach to acquisition; for example, Slobin's (1985*b*) theory of operating principles, which involves a complex set of semantically-based predispositions to language learning, is very much a constructionist approach. Virtually all of the work on acquisition from a functionalist perspective is constructionist, rather than adaptationist. Thus from a functionalist perspective, what the child must acquire in order to speak is markedly different from what must be acquired from a Chomskyan point of view.

2. *WHY SHOULD* DEVELOPMENTAL PSYCHOLINGUISTS CARE ABOUT LINGUISTIC THEORY, ANYWAY?

At the beginning of the Chomskyan revolution in linguistics, there was a great flurry of work on acquisition using the new linguistic model. Even though there are many acquisition researchers still working within the Chomskyan paradigm, a great number of researchers have abandoned models of grammar imported from linguistics. This dillusionment with linguistic models has two main sources. First, many researchers have quit trying to keep up with the rapid changes and developments in linguistic theory. After spending considerable effort to cast their studies in what was thought to be the latest linguistic model, many researchers found that wholesale theoretical changes had rendered their work outdated, sometimes even before it was published. Roger Brown's story (1988) of the fate of the second volume of *A First Language* is a telling example. Some psychologists have gone so far as to maintain that because there is no universally accepted, complete theory of language structure, psychologists should

simply ignore linguistic theory. This is a rather questionable position; linguists could say with equal justification that since there is no universally accepted, complete theory of cognition or learning, linguists should ignore psychology. A more reasonable position would be that psychologists and linguists can each learn from the other's imperfect attempts at understanding language, cognition and learning, and each can contribute to the achieving of the other's goal.

The second, and deeper, reason for this disillusionment stems from the fact that the idealization of the instantaneous nature of acquisition, which follows from the adaptationist conception of acquisition, renders by fiat any results from the study of child language and the actual course of language development largely *irrelevant* to the larger theoretical issues pertaining to acquisition. If the fundamental question of acquisition is posed as in learnability theory, namely, initial state of child + environmental input (positive evidence only, all at once) = final state of adult speaker, then the kinds of studies that child language researchers have traditionally done have no direct relevance to this equation. Wexler & Culicover (1980) state this explicitly (pp. 12–3). The final state of the adult speaker is supplied by generative linguistic theory, and the environmental input is assumed to be minimal beyond the lexical material of the language; the main issue is the intial state of the child, and that is a direct function of the characterization of the final state, which is supplied by linguists.

Another reason for the irrelevance of child language studies to the acquisition issue as framed above is that it is not obviously an empirical question. That is, it is not clear that there are any possible results from child language studies that could falsify the issue as characterized above, and without the possibility of falsification, the issue is not empirical. This can be framed in terms of the 'subset principle' (Berwick 1985), which is normally invoked in discussions of parameter setting. This principle says that when the two settings of a parameter yield two languages, L1 and L2, and L1 is a subset of L2, the default setting should be the one giving L1. This is because there will be positive evidence which distinguishes L2 from L1 and which would lead to the resetting of the parameter to L2, but the converse does not hold: if L2 is the default, there could be no positive data which could lead to the resetting to L1, since L2 subsumes L1. This principle can be applied to hypotheses about language acquisition. Let us consider two hypotheses, H1 (grammar is constructed by the child on the basis of the evidence in the input) and H2 (grammar is not learned but an abstract, pregiven grammatical system is adapted to fit the data to which the child is exposed). H1 is the weaker of the two, since it is possible that detailed studies of the acquisition process and the input to it could show

that some element of grammar could not in principle be learned.[2] The empirical failure of H1 would then lead to H2, the stronger of the two hypotheses. If, on the other hand, H2 is taken as the starting hypothesis, then there is no conceivable fact which could falsify H2 and lead to H1. There is nothing that could prove that some aspect of grammar is not part of an innate autonomous grammatical system; even if one could give a motivated account of how some aspect of grammar could be learned on the basis of the evidence available to the child, an advocate of H2 could always maintain that without the antecedently-given linguistic system in the child no learning would be possible, even with plenty of evidence. Thus H2 is not empirically falsifiable and hence is not an empirical hypothesis about language acquisition. The only way it could be seen to be empirically justified is through the failure of H1, and it is, therefore, ironic that following the subset principle, in order to prove H2 (the adaptationist position), it is necessary to start from H1 (the constructionist position).

These problems underlie the disillusionment that many acquisition researchers feel with respect to linguistic theory, and while these problems are related to specific features of *generative* theory, the result has been a shying away from *all* linguistic theories. However, functionalist linguistic theories in general, and RRG in particular, do not suffer from the problems sketched above. First, generative theories are built around particular formalisms, and formalisms, being empty formal representations, can change rather rapidly. RRG, on the other hand, is first and foremost a substantive theory, built on well-established semantic and pragmatic notions (e.g. semantic roles, the Vendler (1976) system of verb classification, and pragmatic concepts like assertion and presupposition) which cannot be lightly discarded or changed without seriously distorting or destroying the fabric of the theory. Hence analyses done using these concepts and categories will not suddenly become outdated due to a change in formalism fashions. If one thinks back two decades and considers what elements from the linguistic theories of that time have survived, it is clear that most of the formal mechanisms are gone, but substantive semantic notions like semantic roles still play a vital role in almost all linguistic theories. Second, unlike generative theories which have their roots in the analysis of English and familiar Indo-European languages, functionalist theories like RRG have a strong typological component. RRG grew originally out of issues arising out of the analysis of Lakhota (Siouan, North America), Tagalog (Austronesian, Philippines), and Dyirbal (Australian Aboriginal). A cross-

[2] The argument from the poverty of the stimulus is not enough here: detailed empirical investigations are necessary. Otherwise, it is just an 'argument from personal incredulity' (Dawkins 1986) or an 'argument from the poverty of the imagination' (D. Slobin).

linguistic perspective is crucial for acquisition theory; because a child is not preprogrammed to learn any particular language, an essential precondition to the understanding of the task the child faces is knowledge of the range of linguistic systems that the child must deal with. Third, the irrelevance of much of the work of child language researchers to formal theories of acquisition follows from the adaptationist conception of acquisition, which in turn follows from the Chomskyan definition of language, as argued in §1 and FVV, chapter 1. RRG, in contrast, adopts a constructionist conception of acquisition, and since the child is assumed to actually learn grammar, empirical studies of the actual process of acquisition are vital. Hence the work of child language researchers is central, not irrelevant.

Thus the problems with linguistic theory that have led acquisition researchers away from it can be seen to follow from features of generative linguistic theory but not functionalist linguistic theory. This is significant, for a theory of grammar *is* an essential prerequisite for the explanatory study of the acquisition of grammar. Pinker (1989) puts this very well.

> A good model of grammar is necessary for even the most elementary and tentative answers to questions about what it is that is being acquired, how to sort children's utterances into categories, and what mechanisms children are born with that allow them but not kittens to learn language. Disagreements within linguistics are no excuse: there is, in fact, a rich stratum of consensus among contemporary linguists. For starters, they all agree that semantic representations are not just a list of notions in a semantic space, syntax and morphology are not just a list of devices in a formal space, and links between sound and meaning are not done in one step. (463)

3. THE ROLE OF LINGUISTIC THEORY IN THE STUDY OF ACQUISITION

The role that a linguistic theory plays in these investigations depends upon the orientation of the studies. In general, a linguistic theory has three general functions: first, it has a variety of implications for the acquisition process itself; second, it defines the input that is relevant to that process; and third, it provides a framework for explanation. From an adaptationist perspective, the theory serves to characterize the autonomous language acquisition device, and in doing so it delimits the range and kind of input that is relevant to acquisition. If, for example, the LAD is assumed to be based on Lexical-Functional Grammar, as in Pinker (1984), then because LFG makes crucial use of grammatical relations such as subject and object, the acquisition theorist must be concerned with finding information in the input relevant to these notions. If, on the other hand, the LAD is based on

Generalized Phrase Structure Grammar, a theory in which grammatical relations have no theoretical status, then the same kind of information would be completely irrelevant to the acquisition process.

The role of theory from a constructionist perspective is somewhat different. This approach does not claim that a child is born with a functionalist-type universal grammar *qua* LAD and then adapts it to the language at hand; rather, the role of the theory is to describe the nature of the grammar to be acquired and in so doing to make predictions about the course of the acquisition process. As in adaptationist approaches, the input relevant to grammar acquisition is a function of the conception of grammar assumed.

3.1 *Providing a framework for explanation: the acquisition of tense, aspect, modality and negation*

One of the questions that has been of major concern to child language researchers is the order of acquisition of grammatical morphemes like tense and aspect. A great deal of information on this topic has been gathered over the years, and some attempts at explaining the regularities found have been made. In this section it will be argued that RRG can provide an explanatory framework for the analysis of the order of acquisition of the grammatical morphemes marking tense, aspect, modality and negation.

The first step is to characterize the RRG conception of clause structure. RRG differs strikingly from the major varieties of generative grammar in assuming a notion of clause structure *not* based on the X-bar theory of phrase structure; that is, it does not assume English-style constituent structure to be basic to the organization of clauses and phrases in human language. Rather, it assumes a semantically-based conception of clause structure, known as 'the layered structure of the clause' [LSC]. It has two major components. The first is the representation of predicates, arguments and clausal modifiers of certain kinds. The three layers of the clause are the NUCLEUS, which contains the predicate, the CORE, which contains the nucleus and all of the arguments of the predicate, (which are called 'core arguments') and the CLAUSE as a whole. The PERIPHERY, which modifies the core, contains temporal and locative setting elements and NPs which are not arguments of the predicate. The clause also contains the PRECORE SLOT [PCS], the position in e.g. English in which *Wh*-words occur in questions and in which preposed phrases like *John* occur in sentences like *John I can't stand*. The SENTENCE node dominates the clause node, and a sentence may also include a LEFT-DETACHED PHRASE [LDP], the position of a 'topic' phrase like *as for John* in a sentence like *As for John, I haven't seen him for two weeks*. (See Van Valin (1990) for detailed discussion.) The LSC is not an innate template like the X-bar schema. Rather, it is based on two basic oppositions, both of which are derivable from evidence available

to the child. The first is the distinction between arguments and non-arguments, which is deduced from the semantics of the predicate, and the second is the contrast between predicating elements, first and foremost verbs, from non-predicating elements, primarily nouns and adpositional phrases. The latter opposition yields nucleus vs. core and periphery, whereas the former yields core vs. periphery, resulting in the basic universal clause structure.

The second component is the representation of what in RRG are called OPERATORS, which includes notions like tense, aspect and modality. Each of the operators modifies the clause at a particular level; that is, some modify only the nucleus, some modify the core, and others modify the clause as a whole. These scopes are directly a function of their meaning; when a child learns that e.g. tense is a relation between the time of an event and the time of speaking, then he/she has figured out that it is a clausal operator, because it refers to the proposition expressing an event as a whole. Here again this schema is not any kind of innate template; rather, as children learn the LSC and the meanings of these operator categories, they deduce their relative scopes. The operators posited in RRG are given in (1).

(1)

a. Nuclear operators:	Aspect	Narrowest Scope	↑
	Directionals (only those modifying orientation of action or event without reference to participants)		↑
b. Core operators:	Directionals (only those expressing the orientation or motion of one participant with reference to another participant or to the speaker)		↑
	Modality (root modals, e.g. ability, permission, obligation)		↑
	Internal (narrow scope) negation		↑
c. Clausal operators:	Status (epistemic modality, external [wide scope] negation)		↑
	Tense		↑
	Evidentials		↑
	Illocutionary Force [IF]	Widest Scope	

The inner operators are in the scope of the outer ones; this applies both in terms of levels, (for example, core operators are in the scope of clausal operators), but also within levels (for example, tense is in the scope of IF). Operators are represented in a distinct clausal projection from predicates and arguments; the abstract schema is given in Fig. 1, and an example from English is given in Fig. 2 (p. 16).

One of the central questions relating to the acquisition of operators is that of the order in which they are acquired (see Slobin 1973). More specifically, in what order are the morphosyntactic indicators of these categories acquired?

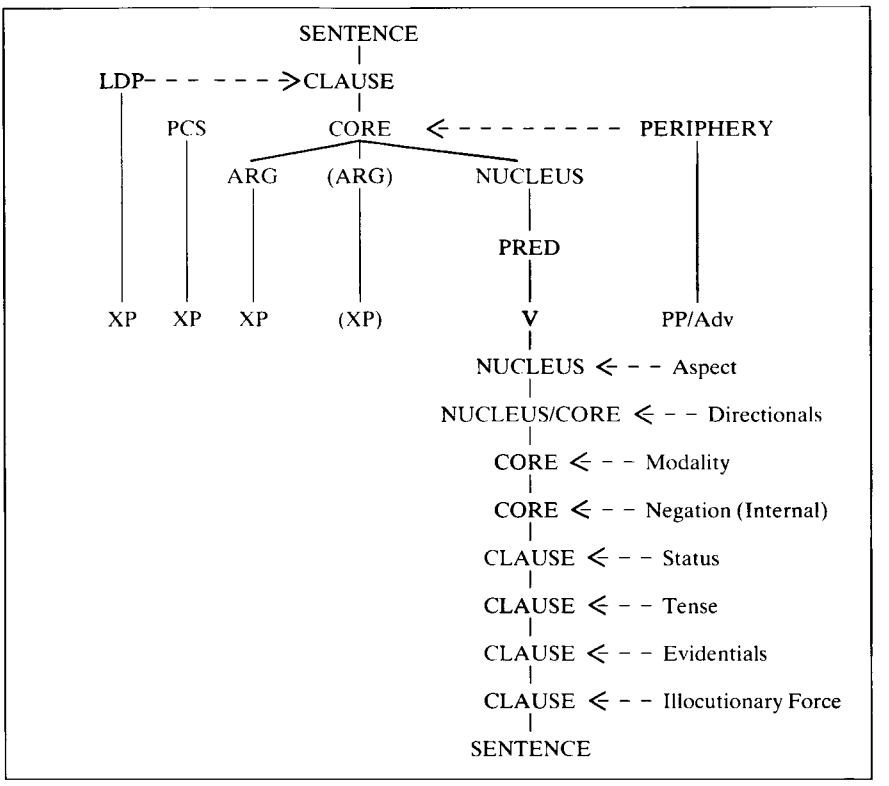

Fig. 1

Particularly interesting in this regard are the acquisition of tense and aspect, on the one hand, and status and modality, on the other. Tense and aspect both have to do with the temporal properties of sentences, and therefore at first glance there does not seem to be any obvious reason why, if a language has distinct markers for tense and aspect, one should be acquired before the other. The operator labelled 'Modality', which covers deontic modality (i.e. notions like ability, permission and obligation), and status, which includes epistemic modality (i.e. notions like necessity and possibility), are distinct albeit related categories which are often expressed by the same lexical or morphological form in a language; here again one may ask why, when, for example, English children are learning modal verbs, they should tend to use them one way first rather than the other. Yet the cross-linguistic evidence is these categories are consistently acquired in a particular order.

With respect to the acquisition of tense and aspect, Antinucci & Miller (1976), Bloom, Lifter & Hafitz (1980), claim that the child's first temporal

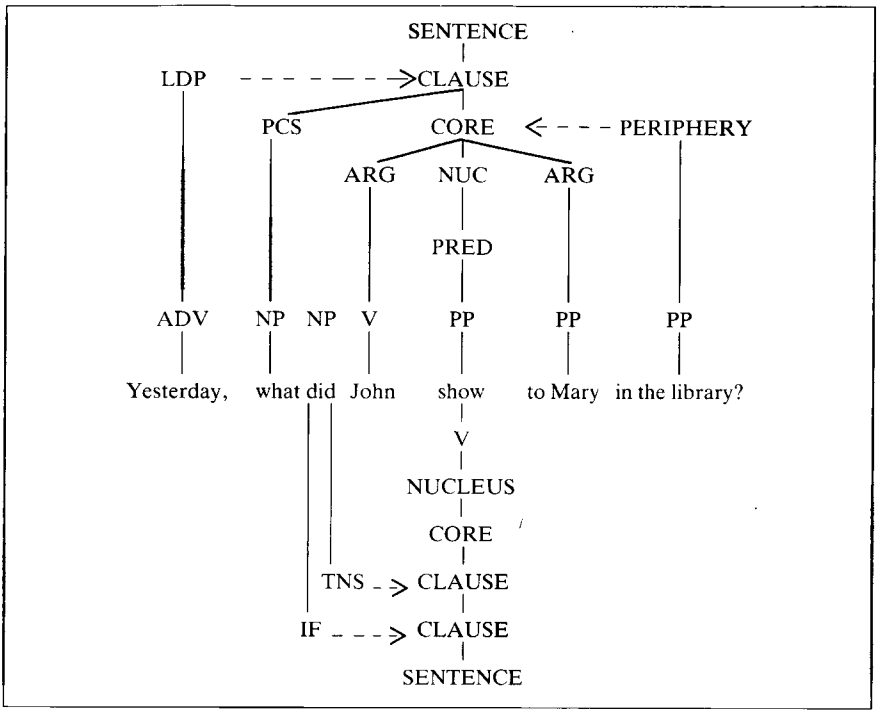

Fig. 2

markings are always aspectual, regardless of how the markers are used in adult speech, and that true tense distinctions develop later. Weist (1986) argues, based on data from Polish, that the claims of this hypothesis are too strong in many respects, but, significantly, he cites no cases in which tense distinctions appear in child language *before* aspectual distinctions. Bloom & Harner (1989) re-examine Weist's data and argue that the Polish facts are in accord with the original claim. Studies of a wide range of languages, for example, Italian (Antinucci & Miller), Warlpiri (Bavin 1989), Hebrew (Berman 1985), and Turkish (Aksu 1978) support the aspect before tense hypothesis. Thus in RRG terms, the nuclear operator aspect is acquired either before the clausal operator tense or at the same time, but the clausal operator is not acquired before the nuclear operator.[3] With reference to the acquisition of modality (deontic) and status (epistemic modality) operators, Stephany (1986) discusses the acquisition of modality in a

[3] It is worth emphasizing that 'aspect' here refers to inflectional aspect, not inherent lexical aspect (or Aktionsart) of the kind referred to in the Dowty/Vendler classification (see §2.2).

number of languages and concludes that 'deontic meanings are expressed before epistemic ones by children acquiring typologically and genetically quite different languages' (398). In RRG terms, the core operator deontic modality is consistently acquired before the clausal operator status.[4]

If these patterns are superimposed on the operators in (1), it is immediately apparent that when there is a definite order of acquisition, the operator learned first is above the operator learned second. This means that the operator acquired first is a modifier of a more inner layer of the clause, and the generalization that is suggested by these two cases is that these operators, i.e. aspect and tense, and deontic and epistemic modality, are learned in the order 'inner - - - > outer'. This can be represented as in Fig. 3.[5]

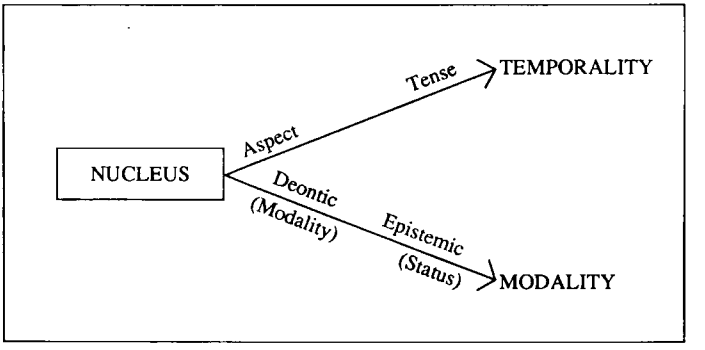

Fig. 3. Pattern of acquisition of tense, aspect and modality

Weist and Stephany both maintain that the explanation for the order of acquisition is to be found in the differing cognitive complexity of the categories. Aspect is less complex than tense because it involves only the internal temporal structure of the event itself, as opposed to tense which expresses a deictic relation between an entire event and a reference time (initially always the time of the speech event), something that requires the child to be able to abstract away from the immediate situation. This, however, is precisely the motivation for calling aspect a nuclear operator and tense a clausal one. Similar considerations apply to deontic and epistemic modality: deontic modality is a relation between an actor and an action, i.e. between a core argument and the nucleus, whereas epistemic

[4] Choi (this volume) presents evidence from Korean regarding this claim, but the operators she includes under epistemic modality are in fact evidentials. RRG rigorously distinguishes evidentiality from epistemic modality (cf. (1), FVV, chap. 5), and this claim concerns only epistemic modals, not evidentials. Hence her findings have no direct bearing on this claim.

[5] I would like to thank Dan Slobin for suggesting this representation to me.

modality concerns the status of an entire event (hence the name of the operator). Modifiers of entire events or situations are clausal operators, modifiers of the relations among participants in an event or situation are core operators, and modifiers of the event itself without reference to participants are nuclear operators. The claim is not that, for example, tense is inherently more cognitively complex a concept itself than aspect, a claim that crucially presupposes an independent measure of cognitive complexity; rather, it is that the difference stems from the complexity of what falls in the respective scopes of each operator: the predicate that is within the scope of aspect is simpler than the whole proposition that is within the scope of tense. Hence the status of an operator as nuclear, core, or clausal, which is a function of its inherent semantic complexity, is the source of the increasing 'cognitive complexity' that Weist and Stephany claim to be the explanation of the order of acquisition. It should be noted that the morphophonological and morphosyntactic complexity of the marker of the operator can serve as an interfering factor in acquisition, but this kind of formal complexity is unrelated to the semantic (or 'cognitive') complexity of the operator.

Negation is also an operator; external or wide-scope negation is a clausal operator, and internal or narrow-scope negation can be a core or nuclear operator, depending on its scope. As a clausal operator negation falls into the status category, since it is a propositional modifier expressing a part of the realis-irrealis continuum that defines the status category and also subsumes epistemic modality. The acquisition of negation in English has been widely studied (e.g. Klima & Bellugi 1966, Bloom 1970, McNeil 1970, de Villiers & de Villiers 1979), and it raises a number of significant issues for this discussion. First, it has been reported that negatives occassionally appear external to the sentence in early child language.[6] This pattern is illustrated in the following exchange, taken from Jaeger (1988); the child, who is 2;3, is watching her mother cut up zucchini for dinner.

(2) a. Ch: Me like zucchini.
b. M: OK, you can have some.
c. Ch: No! Me *like* zucchini. (With negative headshake)
d. M: Oh, you *don't* like zucchini.
e. Ch: Yeah.

[6] It is crucial to distinguish the use of the terms 'external' and 'internal' with reference to the semantic scope of the negation operator from the uses of these terms to refer to the position of the negative morpheme in a sentence. Position and scope are not directly correlated; for example, the negative morpheme in 'John didn't see Mary' is clause-internal, in terms of position, but it is ambiguous as to whether it has a wide-scope (external) or narrow-scope (internal) interpretation.

f. M: Can you say "I don't like zucchini"?
g. Ch: No me like zucchini.
h. M: OK, you don't have to have any.

This interchange illustrates both the anaphoric negative, (2c), which refers to a previous utterance and does not negate the following clause, and the NEG+S pattern, (2g), in which the initial negative is not anaphoric and does negate the clause *me like zucchini*. The two utterances differ significantly with respect to intonation: in (2c) *no* and *me* LIKE *zucchini* are under separate intonation contours, whereas in (2g) *no me like zucchini* is under a single intonation contour.[7] A number of questions arise with respect to this construction. First, is this pattern found only in English or is it widespread cross-linguistically? Second, what is the source of the NEG+S pattern in the speech of children who have it? Chomsky has claimed (MIT class lecture, 5.7.87) that the existence of this pattern is evidence that children are not modelling their emerging grammar directly on the speech to which they are exposed, since, he claims, the NEG+S pattern does not occur in adult speech in any human language.[8] Third, the course of development of negation seems to have some universal features; these require an explanation.

The cross-linguistic existence of the NEG+S pattern in the initial phase of the acquisition of negation is an important question. Verb-final languages are particularly revealing, because in them the external negative pattern would be S+NEG, and accordingly the extraclausal negative, if it exists, would appear in a different position from the anaphoric negative; this eliminates the possibility of confusing the NEG+S pattern with the anaphoric negative pattern. It is also important that there be two formally distinct negative morphemes, as the choice of the morpheme will indicate whether the early negative forms are straightforward extensions of the anaphoric uses. Crucial evidence regarding the initial NEG+S/S+NEG pattern comes from Turkish, Japanese, Polish and French. Slobin (1985*a*), citing data from Aksu-Koç & Slobin (1985) for Turkish and Clancy (1985) for Japanese, contrasts the normal position of the negative morpheme in

[7] Bloom (in press) discusses these phenomena under the heading 'the myth of sentence external negation' and denies that NEG+S is a significant feature of early child language. She maintains that the reported cases of NEG+S in the literature are either anaphoric negatives, like (2c), or are utterances like 'no like milk' in which there is no overt subject and in which the position of the negative is in fact ambiguous between an internal and external position. She claims that examples like (2g) and (4) are simply 'exceptions' (personal communication).

[8] It is not correct to say that no language has NEG+S forms. Barai, a Papuan language, is a strict verb-final language which 'has two negatives. One of them, *ba*, is a [clausal] operator that negates the entire clause and roughly means "it is not the case that". Interestingly, it is the only element which ever follows the verb in heavily verb-final Barai' (Foley & Olson 1985:4; [emphasis added]). Thus Barai does exhibit an S+NEG pattern, the SOV counterpart of the NEG+S pattern.

adult speech with its placement in child language; he presents the following schemata (1985*a*:11–12).

(3) Japanese: Child: *VERB + PAST + *NEGATIVE*
Adult: VERB + *NEGATIVE* + PAST
Turkish: Child: *VERB + TENSE + PERSON *NEGATIVE*
Adult: VERB + *NEGATIVE* + TENSE + PERSON

Aksu-Koç & Slobin (1985:849) note 'an early tendency in child speech for *sentence external negation*' [emphasis added]. In adult Turkish, the negative morpheme for verbal predicates is a suffic *-mE-*, but they report that some children use the negatives for nonverbal predicates, which are not bound elements, with verbal predicates, yielding utterances like those in (4).

(4) a. Anne otur, kalk değil.
mother sit get.up NEG
'Mother sit, don't get up.' (Adult form: *kalk-ma* 'get.up-NEG')
b. Yap-ıcağ-ım ıth.
do-FUT-1sg NEG
'I won't do it.' (Adult form: *yap-mı-yacağ-ım 'do-NEG-FUT-1sg'*)

These data unambiguously show the displaced negative pattern, for two reasons. First, the negative occurs at the end of the sentence, while anaphoric negatives appear at the beginning, just as they do in English; hence there is no possibility of confusing the negatives in these cases with the anaphoric negative pattern. The fact that the negative morphemes in these languages are bound morphemes rather than free morphemes like English *not* is irrelevant; in both cases the negative morpheme appears in a marked position. Second, the negative morphemes in these patterns are *not* the same as the anaphoric negative; consequently it is not the case that the anaphoric negative element has simply been misplaced. Data from French (Clark 1985) and Polish (Smocyńska 1985) further support the extrasentential negative pattern, albeit not as strongly. Clark reports that 'early negatives are usually marked with *pas*, from *ne . . . pas* "not", *a plus* "no more", and *non* "no", either preceding or following the utterance being negated' (1985:700). It is the use of negatives other than the anaphoric negative *non* in *pre-* and *post*-sentential position that is significant; Clark provides no examples of these uses, and so it is not possible to establish the distribution of the individual negative elements, an important question being whether all three negatives occur in both positions. Finally, in Polish, in which the normal negative position is preverbal, as in (5a), examples of both NEG+S (5b) and S+NEG (5c) are reported in the speech of at least one Polish child.

(5) a. Basia nie śpi — 'Basia doesn't sleep.'
Basia NEG sleeps
b. Nie Basia śpi — 'Basia doesn't sleep.'
NEG Basia sleeps
c. Mamusia kopać będzie nie — 'Mommy won't dig.'
mommy dig will NEG

The facts from these four languages provide evidence that the NEG+S/S+NEG pattern is a feature of early child language in languages other than English and is a stage in the acquisition of negation for at least some children.

Given that possibly only Barai children actually hear S+NEG/NEG+S utterances spoken by adults (see fn. 8), what is the source of this pattern? Is Chomsky correct in claiming that it is evidence that children develop their grammar without regard to the data with which they are presented? The first step in answering these questions is determining what kind of negation is found in this pattern: is it wide scope (clausal) or narrow scope (core)? Slobin (1985*b*) states that 'in a variety of ways, children indicate in their restructuring of parental languages that the scope of negation should be *the proposition*, as indicated by the verb or the clause as a whole, rather than any particular nonverbal lexical item within the clause'(1239 [emphasis added]). If the negation is propositional, then the earliest uses of negatives are as a *clausal operator*. This means that the order of acquisition of the uses of negation is clausal - - - > core, or in terms of (1), outer - - - > inner, and this is exactly the *opposite* of the pattern for tense-aspect and modality-status. (CF. Fig. 3.) This is significant, for it means that the acquisition of negation proceeds quite independently of the others and that therefore the interaction among them will not appear early in child language, since it is only when all three clausal operators (tense, status and negation) and the nuclear and core operators (aspect, modality) have been mastered that they will be able to interact fully. (The consequences of this will be discussed below.)

The fact that propositional (clausal) negation is acquired first would seem to undermine the argument regarding 'cognitive complexity' given above to explain the order of appearance of tense-aspect and modality-status; if that line of reasoning is correct, then why doesn't narrow-scope (i.e. core or nuclear) negation appear first? The answer to the question lies in the intimate link between clausal negation and illocutionary force [IF], a relationship not found between tense-aspect and IF or modality-status and IF. The first clausal operator to be learned is undoubtedly IF; that is, the child learns very early to make requests, ask rudimentary questions, and make expressive assertions, at the very least. The first uses of negation are closely tied to the IF of the utterance: they are either direct rejections, in which the negative alone can constitute a complete speech act, or they are what we may call negative

assertions, which have the meaning 'it is not the case that . . .'. There are no comparable aspectual, temporal or (deontic or epistemic) modal speech acts. Hence the early appearance of external (clausal) negation is the result of its illocutionary significance, something which offsets the complexity that arises from its having wider scope than internal negation.

The fact that IF is the first operator learned also has ramifications for the question of the placement of the negative element in utterances. Children are able to make a variety of speech acts before the overt grammatical devices that are used to signal them in adult speech appear in their speech. Different speech acts are marked intonationally at first, and appearance of the explicit non-intonational means for marking them depends largely on the morphosyntactic complexity of the means; with respect to marking interrogative illocutionary force, for example, in languages like Turkish, Japanese and Lakhota in which it is indicated by a simple sentence-final particle, the grammatical marker appears much earlier than in English with its syntactically complex inversion strategy (see Slobin 1985*b*:1241-2).[9] Negation is the *first* clausal operator to appear lexically or grammatically (i.e. non-intonationally). Since clausal operators have the whole clause (in semantic terms, the whole proposition) in their scope, a natural place for the operator to occur is outside of the entity within its scope, in this case, a clause. This is particularly true if the propositions are formally still holophrases without any significantly differentiated internal structure. The most graphic demonstration of the operator-proposition contrast can be seen in (2c), in which the child utters the proposition *me like zucchini* and simultaneously negates it with a headshake; the scope of the headshake is the whole linguistic utterance, the two together constituting the complete speech act. This is similar to the early stages in the acquisition of American Sign Language, in which a headshake acts as a negative operator (Newport & Meier 1985). In this case there is no question that the negation operator is outside of the clause it modifies.[10] These scope considerations predict, then, that it should be possible for clausal negation operators to occur either before or after the clause they modify, and this, as we have seen, is

[9] This is a potential explanation for Choi's findings regarding the early appearance of evidential morphemes in Korean. Also, evidentiality is closely linked to IF, and some of the morphemes in Choi's study are used in Korean to signal both operators. Thus the same kinds of considerations that give rise to the early use of clausal negation in English may will play a role in the early use of evidentials in Korean.

[10] Such scope considerations explain why in languages in which *yes/no* questions are marked by particles, the particles occur either initially (VO languages) or finally (OV) languages, in questions which have the entire sentence in their scope. In most languages the position of the particle is fixed for all questions; some, however, e.g. Turkish, permit the particle to occur within the sentence adjacent to the constituent which is being questioned.

precisely what happens in many instances. There is thus a natural explanation for the NEG+S/S+NEG pattern in terms of the RRG theory of the layered structure of the clause and operators.[11] It is however, a marked pattern in early child language, and moreover some children never produce it and some produce both it and the unmarked pattern; hence it is necessary to explain this variation.

Chomsky's claim that the existence of the NEG+S/S+NEG pattern is evidence that children are not modelling their emerging grammar directly on the speech to which they are exposed can only be addressed in the context of an overall account of the acquisition of negation. The acquisition process appears to involve two basic stages: (1) NEG+S/S+NEG for some children at least some of the time, and (2) internal placement of NEG. This seems to be the case for Japanese, Turkish and Polish. In English, on the other hand, the second stage has two phases: (1) NEG+S for some children at least some of the time; (2) (a) clause-internal positioning of NEG but defective interaction with other auxiliary elements, and (b) full and correct auxiliary placements and the appearance of *do*-support. The crucial thing to be explained is the shift from external to internal placement of the negative. An obvious possible explanation builds on the distinction between internal (narrow-scope) and external (wide-scope) negation and correlates it with position: in the initial phase, the negation is only external (clausal operator), hence the external position, but later the child acquires the contrast between external and internal (core) negation; the negative is then moved to an internal position in order to facilitate expression of its narrower scope. Prima facie support from this comes from English, in which the negative moves to a position after the subject but before the verb, apparently to be in a more appropriate position for negating the verb or verb phrase, e.g. *no the sun shining* → *the sun no shining*. There are, however, some rather severe defects with this account. First, *not* in English can express both internal (narrow scope, core

[11] Two points are relevant here. First, if in a language which has a simple sentence-final question particle (e.g. Turkish or Japanese) both the negative and the question particle co-occur, the theory predicts that the negative morpheme will always occur inside of the IF marker, since the IF marker has wider scope. This is the case for Turkish (Dan Slobin, personal communication). Second, Slobin (1985*b*:1239) proposes the following 'Operating Principle' as part of the human 'Language-Making Capacity' [LMC]:

OP (POSITION): OPERATORS. If a functor operates on a whole structure (phrase or clause), try to place it external to that structure, leaving the structure itself unchanged.

This principle is very much in accord with the predictions of the RRG theory of operators and clause structure; this is represented clearly in the clause structure representations in Fig. 2, in which the elements in the operator projection have scope over the units they modify, and in FVV (chap. 5) we argued that the positioning of operators in clauses is a function of their scopes.

or nuclear) and external (wide scope, clausal) negation from its internal position, and the unmarked interpretation for negation in English is not necessarily internal, despite its clause-internal position. Second, and far more important, in verb-final languages like Japanese and Turkish, the negative does *not* move into a clause-internal position like the English negative. Rather, it maintains its postverbal position and simply moves to a place in the string of suffixes after the verb and before the tense morpheme (cf. (3)); crucially, its position with respect to the verb and the other constituents of the clause is *unchanged*, and it has moved only with regard to the other operators, most notably tense. If the explanation of the movement is the internal-external negation contrast, then Japanese and Turkish remain a mystery, since the slight positional readjustment could hardly signal a major scope contrast vis-à-vis the major constituents of the clause. Third, not all children produce S+NEG/NEG+S utterances, and even though the initial use of negation is always propositional semantically, many children start off by putting it in an internal position. This is rather anomalous, if position is directly and necessarily correlated with scope. It appears, then, that any explanation based on the internal-external scope of negation contrast will be inadequate.

The solution to the problem is implicit in the representation of the layered structure of the clause in Fig. 1. One of the motivations for the dual projection representation of clause structure is that constituents and operators are subject to very different ordering constraints: the constraints on the constituent projection vary considerably from language to language, whereas those on the operator projection are basically universal. The only element common to both projections is the predicate (nucleus), and the ordering constraints on operators are stated with respect to it. In FVV (chap. 5) it was argued that operators are ordered with respect to the nucleus in terms of their scope: the smaller the scope, the closer to the nucleus; the wider the scope, the farther from the nucleus. It was shown that where a definable linear ordering relation exists among the morphemes expressing operators,[12] the linear order of the morphemes directly reflects their relative scopes. This means, for example, that aspect markers will always occur between the verb and the tense marker, if they are on the same side of the verb, and that an overt IF marker will always be the outermost marker. None of the languages surveyed in FVV and Bybee (1985) show *any* exceptions to this claim. In the adult grammar, negation

[12] By 'definable ordering' I mean that the elements in question must occur on the same side of the nucleus; if, for example, aspect is a prefix and tense a suffix, then no definable ordering exists between those two morphemes. Such cases are not exceptions to the proposed generalization, as it simply does not apply to them.

can be a type of status (wide scope) or modality (narrow scope) operator, and its position in the sequence of morphemes expressing operators in English is, like that of modal verbs, just the place for morpheme which can be interpreted as either a core or clausal operator, i.e. between aspect (nuclear) and tense (clausal).[13] In other words, its scope (hence its placement) is reckoned with reference to the nucleus and other operators, as represented in Fig. 4 (which represents the external reading on *not*).[14]

In the discussion of the S+NEG/NEG+S constructions in early child language, it was argued that the external position of the negative element was natural, given that its scope was over the whole clause. In other words,

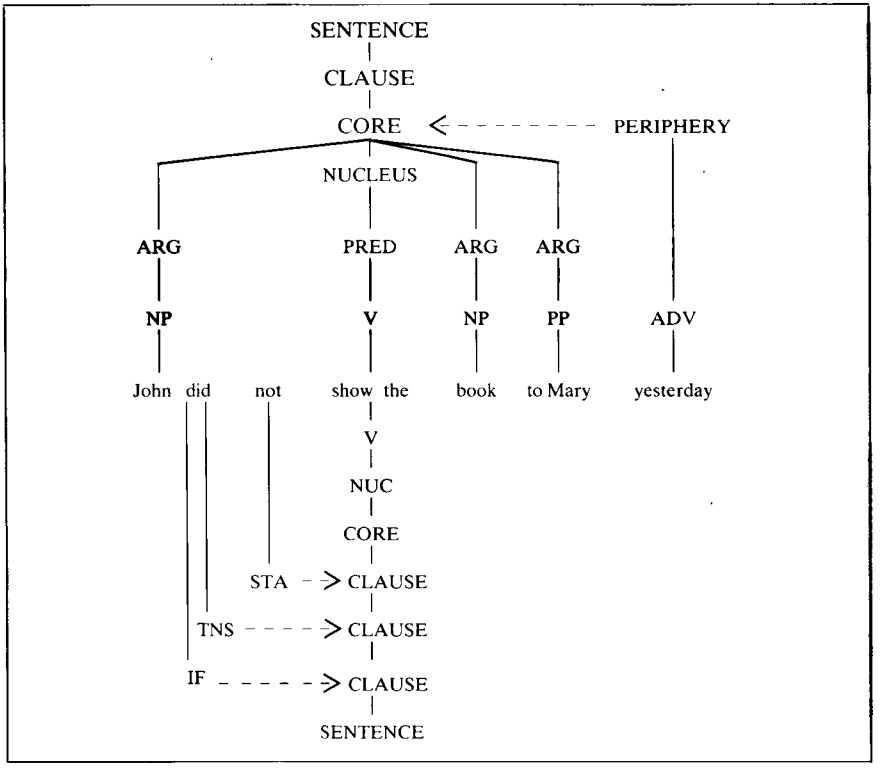

Fig. 4

[13] See FVV, chap. 5, for detailed discussion of the ordering constraints in the English auxiliary system.

[14] Here again we find a convergence between one of Slobin's operating principles of the human LMC (see fn. 11) and a basic principle of RRG. One of the operating principles governing morpheme order is 'relevance' (1985*b*:1238), and it expresses the same general idea as the RRG constraints on operator ordering proposed above.

the reference point for determining the position of the negative element was *the clause as a whole*. However, in adult grammar the reference point for determining the relative scope of operators is *the nucleus*, not the clause as a whole. This is necessary, because operators like aspect and modality have scopes smaller than a clause. Hence the shift from external negative placement to internal negative placement is a function of the change in the reference point for operators from the clause as a whole to the nucleus. One of the stimuli for this shift is the acquisition of the nuclear and core operators which must take the nucleus and cannot take the clause as their reference point. It was pointed out above that the first two operators acquired are IF and negation, both clausal operators, and consequently at that stage there is nothing to tell the child that the clause is not the 'correct' reference point for ordering the operators.

This account immediately explains the shift in Japanese and Turkish (see (3)): in those languages the negative element moves to its appropriate place in the operator chain (inside of tense), as determined by its meaning. Exactly the same thing is happening in English, but because English is verb-medial, the negative must jump over the subject, thereby creating the illusion that the shift is related to semantic questions of narrow- vs. wide-scope negation. It also accounts for the possibility of individual variation: some children start off taking the clause as the reference point for the clausal operators, and they will be the ones producing the initial S+NEG/NEG+S patterns and later shifting the negative, whereas some choose the nucleus as the reference point for all operators from the beginning and will therefore not produce any displaced negatives. With respect to Chomsky's claim that displaced negatives show that children construct their grammar with little regard for the adult patterns, this discussion has shown that to be false; children do follow the adult model of treating negation as a clausal operator, but some differ in assuming a different reference point for it from the one assumed in the adult grammar. There is, thus, a natural source for the NEG+S/S+ NEG construction, even though adults do not provide a direct model for it.

The English situation is more complicated than that in Turkish and Japanese, as noted above, and it deserves comment. As is well known, negatives begin appearing internal to the clause before the whole complex auxiliary system is mastered. It was argued above that temporality and modal operators are learned independently of negation, but at some point they must all come together. As shown in FVV (chap. 5), the major elements of the English auxiliary system follow the universal ordering schema, but the requirement that tense be realized on the leftmost verbal element generates considerable complexity, particularly when the negative appears in its appropriate place between tense and the main verb. Tense

cannot attach to the negative element, because it is not a verb, but it also cannot cross it to attach to the main verb, because tense is a more outer operator that either status or modality and for it to do so would violate the universal operator ordering principles in (1). The use of *do* to carry stranded tense operators solves the problem, and since negation can be either status or a core operator like modality, the appearance of regular *do*-support indicates that the child has learned tense, status, modality and their interactions, as well as IF.

3.2 Defining the input: island phenomena

One of the important functions of a linguistic theory is to define the input that is relevant to grammar acquisition, and as an example of this, I will sketch out an approach to the acquisition of the constraints on extraction known as Ross or island constraints. These are particularly interesting, for it is normally assumed that there is no input relevant to them at all. In GB these restrictions are accounted for in the bounding theory module of UG. From a RRG point of view, however, they can be seen to be related functionally to other grammatical phenomena, and phenomena which are formally distinct but functionally equivalent can be given a unified explanation.

One of the original constraints, the Complex NP Constraint (Ross 1967), is illustrated in (6); movement of a question (*Wh*) word out of a noun complement clause, as in (6d), or out of a relative clause, as in (6f), is prohibited. This restriction has been subsumed under the more general principle of subjacency in GB theory.

(6) a. Fred believes that Mary saw a UFO.
b. What does Fred believe that Mary saw ____?
c. Fred believes the claim that Mary saw a UFO.
d. *What does Fred believe the claim that Mary saw ____?
e. Max talked to the man who bought the house down the street.
f. *What did Max talk to the man who bought ____?

Facts such as these have often been cited as the strongest evidence for the existence of autonomous linguistic principles underlying acquisition, because, it is argued, there is absolutely no evidence regarding this constraint available to the child and therefore the only way we can have it in our internal grammar is for it to have been there from the start. This is the standard 'poverty of the stimulus' argument.

In the GB analysis, the explanation of the facts in (6) is stated in terms of the movement of NPs, in this case *Wh*-words, across a specified class of 'bounding nodes' (NP, S, S-bar), or in more recent terms, barriers. However, there are languages such as Lakhota, a Siouan language of

North America, which have no movement of *Wh*-words in their syntax at all, and yet they apear to exhibit some of the same restrictions as English. This is illustrated in (7) from Lakhota.

(7) a. šų ka ki igmú wą yaxtáke. 'The dog bit a cat.'
dog the cat a bit

b. šų ka ki igmú wą yaxtáka he? 'Did the dog bite a cat?'
dog the cat a bit Q

c. šų ka ki táku yaxtáka he? 'What did the dog bite?'
dog the what bit Q

d. táku igmú wą yaxtáka he? 'What bit a cat?'
what cat a bit Q (*'What did a cat bite?')

e. *wičháša ki [[šų ka wą táku yaxtáke] ki le] wąyą ka he?
man the [[dog a what bite] the this] saw Q
'*What did the man see the dog which bit ____?' (cf. (6f))

Yes/no questions are formed in Lakhota by adding the interrogative particle *he* to the end of the sentence, as in (7b). When a *Wh*-question is formed, as in (7c,d), the *Wh*-word, in this case *táku* 'what, something', appears in place of the argument to be questioned; it does not move to the beginning of the sentence, as shown most clearly in (7c). (7e) illustrates the impossibility of formining a *Wh*-question in a definite restrictive relative clause in Lakhota; the *Wh*-word appears inside the relative clause (in brackets), and despite the fact that it does not move across any potential bounding nodes (barriers), the restriction exemplified in (6f) is in force here.[15] To handle such cases, GB posits movement of *Wh*-words at the abstract level of Logical Form and maintains that in a language like this subjacency is a restriction at Logical Form and not in the syntax. (Chomsky 1986*a,b*) Given the abstractness of this analysis, it is inconceivable that Lakhota children could learn such a restriction, and this is taken as evidence for the adaptationist view of acquisition.

In Van Valin (1990) an RRG account of island constraints is proposed; it is based on Erteschik-Shir and Lappin's 'Dominance theory' of extraction restrictions (Erteschik-Shir 1979, Erteschik-Shir & Lappin 1979). Let us begin the functionalist analysis by looking at some phenomena which have nothing to do with island constraints from a GB viewpoint, namely, the interpretation of *yes/no* questions. One of the things which children must learn is how to construct and interpret *yes/no* questions, that is, learn to interpret correctly what is being questioned and to construct questions in

[15] This sentence is grammatical with the reading 'did the man see the dog which bit something?', which is not a *Wh*-question and therefore not relevant to the issue of extraction restrictions.

such a way that the information they are asking about is in a part of the sentence which can be interpreted as being questioned. For example, they learn that the question in (8a) can be answered felicitously by any of the responses in (8b) but that the same is not true for (9a). (In all of the following examples, I am assuming normal, non-contrastive intonation and propositional rather that metalinguistic negation.)

(8) a. Did Johnny go to the beach yesterday?
b. Yes.
No.
No, Fred did.
No, to the park.
No, day before yesterday.

(9) a. Yesterday, did Johnny go to the beach?
b. Yes.
No.
No, Fred did.
No, to the park.
?No, day before yesterday. (Better: No, it was day before yesterday.')

The slight oddity of the last response in (9b) as opposed to (8b) is due to the fact that it is much more difficult to construe *yesterday* as potentially part of the question in (9a) than in (8a). What children must learn, in other words, is what parts of a sentence are possibly being presupposed and what parts are possibly being questioned. The issues becomes more complicated when complex sentences are involved, as in (10)–(14).

(10) a. Did you take Mary to the movies after you left the party?
b. Yes.
No. (= didn't take Mary, ≠ didn't leave the party)
No, Bill did. (= Bill took Mary, ≠ Bill left the party)
No, Susan.
No, before.
No, the park. (= went to the park, ≠ after you left the park)

(11) a. After you left the party, did you take Mary to the movies?
b. Yes.
No. (= didn't take Mary, ≠ didn't leave the party)
No, Bill did. (= Bill took Mary, ≠ Bill left the party)
No, Susan.
?No, before. (Better: No, it was before we went to the party.')
No, the park. (= went to the park, ≠ after you left the park)

(12) a. Did Max return the papers which the secretary photocopied to the lawyer?
b. Yes.
No. (= Max didn't return the papers, ≠ the secretary didn't photocopy)
No, Bill did. (= returned the papers, ≠ photocopied the papers)
No, the envelopes.
No, the IRS agent. (= to the IRS agent, ≠ which the IRS agent photocopied)

(13) a. Did Fred tell Maggie the rumour that Bill's wife punched Susan?
b. Yes.
No. (= Fred didn't tell Maggie, ≠ Bill's wife didn't punch Susan)
No, Bill did. (= told Maggie, ≠ punched Susan)
No, Mary, (= told Mary, ≠ Mary punched Susan, ≠ punched Mary)

(14) a. Did Fred say that Bill's wife punched Susan?
b. Yes.
No. (= Fred didn't say it, ≠ Bill's wife didn't punch Susan)
No, Bill did. (= said it, ≠ punched Susan)
No, Mary, (= punched Mary, ≠ punched Susan)

The interesting thing about the constructions in the (a) sentences is that they are not uniformly accessible to being questioned; some parts can be interpreted as the focus of the question, others cannot. In (10)–(13) only the main clause can be questioned, while in (14) both the main clause and at least some part of the complement clause can be questioned. Thus it appears that certain sentence parts cannot be the focus of a *yes/no* question, e.g. a relative clause as in (12), while others can always be, e.g. the elements of the main clause.

On the standard GB-type account, the phenomena in (8)–(14) have nothing to do with the facts in (6), because there is no movement of NPs of any kind in these examples. The explanation for the interpretation of (10)–(14) is completely unrelated to that for the facts in (6); indeed, it would probably be treated in the realm of pragmatic competence, not grammatical competence. From a functionalist perspective, on the other hand, the phenomena in (6)–(14) are closely related, since they all involve the same communicative function, namely the formation of interrogative speech acts. It is striking that the parts of (12)–(13) which cannot be interpreted as being questioned in a *yes/no* question correspond precisely to the syntactic islands out of which it is impossible to extract a question word in (6); moreover, the possibility of extraction out of the complement clause in (6b) correlates with the possibilities of interpretation in (14b). *This is no*

accident. Simple *yes/no* questions and *Wh*-questions are two sides of the same coin, namely interrogative speech acts, and the pragmatic markedness of syntactic constructions relevant to them; that is, the restrictions on the interpretation of particular syntactic constructions as being potentially questionable, is the same for both types of questions. In the RRG analysis, the restrictions on the potential focus of *yes/no* questions and those on *Wh*-questions are stated in the same terms: the focus of the *yes/no*-question and the site of the *Wh*-word must be in what is called the *potential focus domain* of the IF operator over the sentence. This can be seen most clearly in the Lakhota examples in (7). The IF operator is instantiated by the sentence-final particle *he*, and in a *yes/no* question, anything that falls within the scope of *he* can be interpreted as the focus of the question. In a simple clause like (7b), any of the major constituents can be the focus. In a complex sentence like (15a), however, the entire construction is not in the scope of *he* and therefore there are restrictions on the interpretation of the focus, just as in (10)–(14) in English.

(15) a. Wičháša ki Ø-wóte ečhúhą, tha-wíču ki mní i-Ø-Ø-kíču he?
man the 3sg-eat while his-wife the water 3sg-3sg-bring.for Q?
'While the man was eating, did his wife bring him water?'
– Hiyá, Fred (mní ikíču/*wóte).
'No, Fred brought water to him' (or 'she brought water to Fred')/
*'Fred was eating.'

b. Wičháša ki táku Ø-yúte ečhúhą, tha-wíču ki mní i-Ø-Ø-kíču he?
man the *what/something 3sg-eat while his-wife the water 3sg-3sg-bring.for Q
'While the man was eating something, did his wife bring him water?'
*'What did his wife bring him water, while the man was eating?'

If one wished to give a negative answer to (15a), the only things that could be denied are in the main clause; in the response given, 'No, Fred' could mean either that she brought the water to Fred rather than her husband or that Fred took the water to her husband, but it could not mean that Fred and not the man was eating. That is, the focus of the question cannot be in the *ečhúhą* clause; in other words, the elements in the *ečhúhą*-clause are not in the scope (potential focus domain) of the IF operator *he*. In order for *táku* 'what, something' to be interpreted as a question word, it must be in the scope of *he*, as in (7), and in (15b) it is in the *ečhúhą*-clause. It is therefore impossible to interpret *táku* as a question word, and it can only be understood as an indefinite pronominal; hence (15b) can only mean

'while the man was eating something, did his wife bring him water?'. This is also the case in (7e); *táku* in the relative clause is outside of the scope of *he*. For English this means that the gap in the clause correlated with the *Wh*-word in the PCS must be in the potential focus domain of the IF operator over the sentence.

The restrictions illustrated in (10)–(15) are a function of the restrictions on the scope of the IF operator in complex sentences, and these restrictions on IF scope in turn reduce its potential focus domain, thereby constraining where the focus of a question (*yes/no* or *Wh*) can fall (see Van Valin (1990), §§3, 7.6, 8.3, for detailed discussion). Thus a unified account can be given of formally distinct but functionally equivalent phenomena in typologically very different languages.

As noted above, it is commonly asserted that there is no evidence available to the child concerning constraints on extraction, in this case *Wh*-question formation, but there is in fact abundant evidence available to the child regarding the range of possible interpretations of *yes/no* questions from his/her own interactions with caretakers and peers and from observing the verbal interactions of others. It has never been suggested that the provenance of a child's knowledge of the principles governing the interpretation of *yes/no* questions is anything other than the verbal interactions in which the child is involved. The restrictions on *yes/no* questions so acquired are naturally extended to other types of questions, in particular, *Wh*-questions. Thus the child's knowledge of restrictions on *Wh*-question formation has its source in the learned restrictions on *yes/no* questions.

What evidence is there that such a transferring of syntactico-pragmatic restrictions occurs? A clear example of this transference of restrictions can be found in Wilson & Peters's (1988) study of a three-year-old blind child's production of *Wh*-questions which apparently violate extraction constraints; some of his deviant *Wh*-questions are given in (16).

(16) a. What are you cookin' on a hot ____?
b. What are we gonna go at [to] Auntie and ____?
c. What are we gonna look for some ____ with Johnnie?

Wilson & Peters show that the constructions have their source in a questioning routine that the child engaged in with his primary caregiver. Examples of it are given in (17).

(17) a. Caregiver: What did you eat? Eggs and . . .
Child: Mbacon.
b. Caregiver: Oh, that's a . . .
Child: Aleph.
Caregiver: That's a aleph.

In this routine the caregiver leaves a gap in his utterance which the child is expected to fill in. The child learned the routine, and then the restrictions on question formation derived from it were incorrectly assumed to apply to movement *Wh*-questions as well; when the child learned to make movement *Wh*-questions, he applied these restrictions to them, leading to the questions in (16). The account that Wilson & Peters give of these questions thus provides evidence that children do in fact transfer the restrictions learned for one type of question to other types.

An important feature of this analysis is that it applies equally to the Lakhota examples in (7) as it does to the English examples in (6); unlike the GB account, whether a language has *Wh*-movement or not is irrelevant to its formulation. The account of how the constraints could be learned also applies to Lakhota children, since they too have to learn what can be questioned and what cannot be in *yes/no* questions like (7b) and in the Lakhota equivalents of (10)–(14), e.g. (15a). Here again we see how formally distinct but functionally equivalent phenomena, in this case English and Lakhota *Wh*-questions, can be given a unified treatment.

This discussion has touched on only one type of extraction phenomenon, *Wh*-question formation, and a complete account must deal with the other extraction phenomena. Nevertheless, it has shown how a pragmatic explanation of extraction constraints can be constructed and what the implications of such as account are for acquisition. The redefinition of the grammatical phenomenon in terms of the interaction of pragmatics and syntax has led to a radically different delineation of what the relevant input for acquisition could be. Arguments like the venerable 'argument from the poverty of the stimulus' seem to presuppose that if the child is not explicitly presented with positive and negative exemplars of the phenomenon in question, then there is no evidence regarding it available. However, this analysis of the acquisition of extraction constraints shows that knowledge of one area of the grammar for which there is abundant evidence can be extended to other, related areas of the grammar for which such evidence is apparently (or supposedly) not available. These claims are empirically testable through research on child language; the analysis presented here requires detailed studies of the development of *yes/no* and *Wh*-questions, among other things, in order to establish its ultimate formulation and validity.

4. CONCLUSION

The primary goal of this paper has been to show that functionalist linguistic theory in general and RRG in particular can make important contributions to the study of child language and language acquisition. The problems that have led to disillusionment among language acquisition researchers with

respect to the potential value of incorporating theoretical models from linguistics can be traced to particular features of generative linguisic theory, features not shared by functionalist linguistic theories like RRG. Moreover, it has been argued that RRG provides an explanatory framework for the analysis of the acquisition of notions like tense and aspect and of the acquisition of restrictions on question formation that have long been held to be unlearnable and the strongest evidence for the Chomskyan model of the LAD. Thus, functionalist linguistic theory, and RRG in particular, has much to offer students of child language and language acquisition.

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APPENDIX

IMPLICATIONS FOR MODULARITY[16]

This analysis of extraction restrictions has some interesting theoretical implications for the issue of modularity. In Van Valin (1986) it was shown how the crucial notions in this account can be grounded in Grice's pragmatic theory; the restriction stated here in terms of the potential focus domain of the IF operator was labelled 'the IF scope condition' there. The definitions of 'presupposition' and 'assertion' (and therewith 'focus') are derived from Kempson's (1975) reformulation of Grice's maxim of quantity. The Gricean foundation for these principles is crucial. Within the modular theory of cognition put forth in Chomsky (1980, 1981, 1986*a*), linguistic competence is divided into two different modules, grammatical competence and pragmatic competence. Grammatical competence encompasses knowledge of grammar, a complex of interacting modular sub-theories. Pragmatic cometence, however

> may include what Paul Grice has called a 'logic of conversation.' We might say that pragmatic competence places language in the institutional setting of its use, relating intentions and purposes to the linguistic means at hand. (Chomsky 1980:224–5)

Thus Grice's Cooperative Principle and concomitant maxims may compose part of our pragmatic competence.

The native speaker's ability to judge the appropriateness or deviance of the examples in (8)–(14) demonstrate the applicability of these principles and their derivatives to inter-speaker phemonena. Kempson argues that the inappropriateness of many of the possible responses follows from Grice's maxim of quantity. She first defines the *Pragmatic Universe of Discourse*, the domain of knowledge and beliefs shared by the interlocutors, and then reformulates Grice's maxim of quantity as a criterion for informativeness:

> For any proposition p whose truth is minimally guaranteed by n conditions, and any mood [IF-RVV] operator '$*\psi$', only say '$*\psi p$' if $\leq n$-1 of those conditions are members of the Pragmatic University of Discourse. (1975:170)

This underlies the contrast between presupposed (outside the potential focus domain of the IF operator) and non-presupposed (within it) material

[16] An earlier version of this discussion appeared as Van Valin (1986).

in an utterance, and she deduces the notion of being within the potential focus domain of the IF operator and the IF scope condition from it:

> The speaker believes the hearer knows (and knows that the speaker knows) a certain body of propositions (i.e. there is a Pragmatic Universe of Discourse) and in making a certain utterance '*ψp' he believes that the hearer, knowing the conventions of the language and hence the conditions for the truth of the proposition in question, will recognize a subset of those conditions as being part of that Pragmatic Universe of Discourse and hence neither assertable, deniable or queriable (without violating the quantity maxim), and a second mutually exclusive subset of the conditions as being outside the Pragmatic Universe of Discourse. This latter set, he will interpret as being asserted, denied, commanded or queried. (1975:190)

This is the pragmatic explanation for (8)–(14) in English and (7e) and (15a) in Lakhota.

If (13a) is turned into a *Wh*-question, as in (18a), it becomes a subjacency violation like (6d); an approximation of its S-structure is given in (18b).

(18) a. *Who did Fred tell Maggie the rumour that Bill's wife punched?
b. $[_{COMP}$ Who$_i$ $[_S$did Fred tell Maggie $[_{NP}$ the rumour $[_{\bar{S}}$ that Bill's wife punched $t_i]]]]$

On the RRG account in §3.2, both (13a) and (18a) would be explained in terms of the IF scope condition, and therefore if the knowledge underlying the recognition of the deviance of (18a) is a feature of a speaker's grammatical competence, then the principle of informativeness and the IF scope condition must be part of a speaker's grammatical competence. Since (13a) involves an interaction between two speakers, the knowledge underlying the recognition of its deviance must be a feature of a speaker's pragmatic competence.

A crucial question must now be raised. The modularity theory demands that the principles of grammatical competence by autonomous with regard to the other mental modules; in particular, they must be independent of those in pragmatic competence and non-linguistic modules. It appears, however, that the same principles (informativeness and the IF scope condition) do function in both grammatical and pragmatic competence. There is, therefore, a non-trivial redundancy between the two modules. When such redundancy has arisen among the components of grammatical competence, the standard move has been to eliminate the redundant component and derive its properties from the others. Given the overlap

between grammatical and pragmatic competence noted, at least three options for solving this problem are available.

(19) a. Redundant modularity: the principles in question belong to both types of competence.
b. Non-redundant modularity: since these principles are derived from Grice's Cooperative Principle and concomitant maxims, which are components of pragmatic competence, they are part of pragmatic competence only.
c. No modularity: abandon the division between pragmatic and grammatical competence and permit pragmatic principles like these to interact directly with grammatical principles.

Option (19a) expresses the attitude that the overlap is not significant and is to be ignored. There are at least two serious problems with this approach. First, by postulating the same principles in both modules a potentially significant generalization about the organization of human linguistic ability is being missed. Second, and more important, the principles of grammatical competence are supposed to be purely linguistic, whereas those of pragmatic competence need not be. The principle of informativeness is a reformulation of Grice's maxim of quantity, and Kasher (1976) argues that Grice's principles can be derived from general principles of rational action. Grice himself maintained that they applied to both linguistic and non-linguistic behaviour. Hence it would be impossible to maintain that this principle is exclusively linguistic in nature, since it can be deduced from general non-linguistic principles. Moreover, that it is also in pragmatic competence severely undermines the claim that the contents of grammatical competence are unique and unrelated to any other mental modules.

The conception in (19b), non-redundant modularity, avoids all of the difficulties with (19a), but at a cost: the weakening of grammatical competence. In this view, all pragmatically-related principles are part of pragmatic competence, and the purely grammatical ones are components of grammatical competence. The striking feature of this distribution is that the principles governing island phenomena, long considered a prototypical example of formal syntactic phenomena, would be taken out of grammatical competence, thereby weakening it significantly. The final alternative, no modularity, has the highest price: it returns the principles governing island phenomena to the grammar at the cost of permitting pragmatic and grammatical principles to interact directly, a radical move that is thoroughly incompatible with Chomskyan theory.

Each of these three possibilities has profound implications for the theory of language acquisition. Grice's Cooperative Principle and maxims are general principles of rational behaviour, and therefore they are applicable

to other areas of human interaction besides language. It cannot be the case, therefore, that they are learned on the basis of any kind of exclusively linguistic, autonomous mental organ. Therefore the acquisition of at least a part of a speaker's pragmatic competence is not explicable in terms of an autonomous linguistic cognitive capacity. The theories of language acquisition corresponding to the options in (19) are given in (20).

(20) a. Redundant modularity: the principle of informativeness and the IF scope condition are acquired in two different ways, depending upon which module they are in. The versions in pragmatic competence are not acquired on the basis of an autonomous linguistic cognitive structure, whereas the versions in grammatical competence are.

b. Non-redundant modularity: these principles are part of pragmatic competence and are not acquired on the basis of an autonomous linguistic cognitive structure; the rules and principles of grammatical competence are so acquired.

c. No modularity: these principles are acquired as in (20b); the acquisition of the more grammatical principles may or may not be based on any purely linguistic cognitive structure.

Position (20a) makes the curious claim that children arrive at the same principle twice and in two different ways: the principles in pragmatic competence are deduced at least in part from non-linguistic general principles of rational action, whereas those in grammatical competence are derived from the setting of certain parameters of autonomous linguistic principles in the grammar module. (20b) avoids this claim, since the components of each kind of competence are acquired in distinct fashions, and in no case is the same knowledge acquired more than once or in more than one way. However, since the principles accounting for island phenomena are part of pragmatic competence, not grammatical competence and are not therefore acquired on the basis of uniquely linguistic principles, many of the central phenomena that were at one time the most powerful argument for autonomous grammar module are no longer handled by specifically linguistic principles, severely weakening the significance of the autonomous mental organ of language. The position in (20c), like its counterpart in (19c), is at odds with the Chomskyan conception of language and mind, and like (20b), it allows for the acquisition of island constraints without the help of autonomous linguistic principles.

Thus the account of restrictions on question formation presented in §3.2 is fundamentally incompatible with the modularity thesis; not only does it provide a plausible, empirically testable explanation for their

acquisition, but it also severely weakens the case for autonomous linguistic principles underlying acquisition. This case has always rested on the precarious foundation of the 'argument from the poverty of the stimulus', which has two crucial presuppositions: (1) the lack of any external evidence for the psychological status of the constructs in question, and (2) the lack of any minimally plausible alternative account of their acquisition. It collapses if either of these two fails to hold, and the analysis in §3.2 undercuts the second condition by offering not simply a plausible account of how a child could learn these restrictions but also one which is empirically supported by the Wilson & Peters study. Thus the question of whether the restrictions known as island constraints are learned or are part of an autonomous linguistic cognitive structure is now an empirical one, one which must be decided by empirical investigation and not by the argument from personal incredulity.