
Linguistic Foundations of Clinical Language Teaching: Grammar

Fondement linguistique de l'enseignement clinique du langage: la grammaire

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Résumé

On propose de modifier l'orientation théorique de l'évaluation et de l'enseignement cliniques du langage en la faisant passer d'un modèle linguistique externe à un modèle linguistique interne. Un tel changement comporterait l'ajout d'un point de vue «innéiste» de l'acquisition du langage aux méthodes d'évaluation et d'enseignement cliniques. En outre, l'adoption d'une telle conception rendrait nécessaire l'élaboration de méthodes d'évaluation par lesquelles le langage d'un enfant constituerait une grammaire intermédiaire se situant quelque part entre la grammaire universelle innée et la grammaire adulte utilisée dans l'environnement courant. Serait également nécessaire l'élaboration de méthodes d'enseignement qui déclencheraient des modifications à la structure de la grammaire intermédiaire pour la rapprocher de la grammaire adulte. Des essais préliminaires de caractérisation et d'opérationnalisation de telles méthodes sont ici présentés.

Abstract

A proposal is made to change the theoretical orientation of clinical language testing and teaching from a linguistic-external to a linguistic-internal model. Such a change would entail incorporating an innate view of language acquisition into clinical testing and teaching methods. Adopting such a view necessitates the development of testing methods that approach a child's language as an intermediate grammar that lies between an innate universal grammar and the adult grammar spoken in the environment. Also, it necessitates the development of teaching methods that trigger changes in the structure of the immediate grammar that move it closer to the adult grammar. Preliminary attempts to characterize and operationalize such methods are presented.

For the last three decades, a group of researchers who have come to be known as psycholinguists has been trying to explain how language is learned. While there is significant theoretical diversity among members of this group, most share the working hypothesis that the processes involved in language acquisition are not independent or unique with regard to other cognitive domains. They assume that language acquisition is epiphenomenal; that it has no independent stature as a developmental process. Rather, they view language acquisition as a byproduct of general cognitive processes which lie

outside the domain of language (Atkinson, 1987; Jackendoff, 1988). While this assumption has been opposed by certain groups of theoretical linguists who hold that language acquisition is a unique learning process, the opposition recently has become more unified and visible under the theoretical guidance of the latest version of the line of generative theories called Government-Binding Theory (Chomsky, 1981a; b; 1986a; b; Hyams, 1987). One of the hallmarks of the generative approach has been the proposal that language acquisition is a uniquely linguistic process that cannot be reduced to linguistic-external phenomena without seriously misrepresenting what is known about the nature of language and the process of its acquisition.

The work of speech-language pathologists has been influenced greatly by the psycholinguistic assumption as has other applied language fields (Cook, 1988.) It seems that the intuitive appeal of the assumption together with the lack of a viable alternative have contributed to its general acceptance among practitioners. The emergence of a potentially viable alternative explanation of language acquisition in the form of Government and Binding theory provides an opportunity to examine the rationale for current clinical practices and to ascertain whether changes might be in order. The purpose of this paper is to attempt to persuade speech-language pathologists to review their allegiance to the linguistic-external explanation of language acquisition and to consider an alternative view that is more closely allied to recent developments in generative linguistics. The alternative model that will be offered proposes that language acquisition is primarily a product of language-internal processes, processes that are irreducible and uniquely linguistic, processes that are only tangentially related to general cognitive or pragmatic factors. A change in theoretical perspective such as this does not necessarily signal drastic changes in clinical practice, but if some of the suggested changes in perspective were adopted, then certainly some significant clinical changes would ensue. Adopting these changes would not preclude linguistic-external processes from possible explanations of language impairments, rather it would open another avenue of investigation

for clinicians. It will be argued that the addition of this new model may have the practical benefit of leading to a more clinically meaningful diagnosis and description of language learning impairments and more effective approaches to clinical language teaching. Besides these benefits, the model can offer practicing clinicians a coherent theoretical framework from which to view their clinical work; a framework that capitalizes on the conspicuous but heretofore confusing parallels between the normal language learning and the clinical teaching processes.

The Reductionist Hypothesis

As stated earlier, the basic working assumption of many psycholinguists is that language acquisition is a product of development in other domains, most notably, in cognitive, perceptual, and pragmatic domains. This approach to explaining language acquisition can be described as reductionist in that it seeks to reduce the process of language learning into its component cognitive and perceptual parts. Language acquisition, thus construed, can be viewed as being one of many cognitive domains that a child acquires using general learning strategies. One well known facet of this reductionist view is the hypothesis that language learning is accomplished by means of the learning mechanisms inherent in sensorimotor intelligence (Bates, 1976). Within this proposal, the structure of sentences is thought to derive from the perception, categorization, and mental representation of world events, processes that are the hallmark of the sensorimotor mind. For example, a real world event might be mentally represented as an episode in which an actor performs an action on an entity. It is proposed that, from this conceptual representation of the event, a language learning child develops a generative linguistic representation of the structure of a sentence that would describe the event. This structure might be formalized as S- → Agent + Action + Patient: denoting that sentences of this nature are composed of an argument that serves the role of agent, followed by a predicate that expresses the action performed by the agent, followed by an argument that serves the role of patient of the agent's action. Thus, it is proposed that this type of linguistic representation emerges from a one-to-one translation of existing mental representations of events. Nothing uniquely linguistic is involved in this translation process. The rule learned for generating linguistic products is simply a logical extension of existing cognition.

The second popular view is that this translation process makes use of categories that are developed within a pragmatic domain. For example, it has been claimed that the earliest grammars, grammars preceding the semantic grammars described above, derive from a communication strategy that orders words according to the role they play in providing information to the listener (Bates & MacWhinney, 1979, 1982).

The topic of the information is given the place of prominence at the beginning of an utterance, and the content of the information follows. This ordering of information is carried into the structure of sentences in that the topic is placed first in a sentence, or is elided when the topic is shared, and the comment is placed last. Again, nothing new or uniquely linguistic needs to be posited to explain the acquisition of this early grammar.

The general weakness of these and other reductionist positions is their failure to account for evidence that indicates that the products of language acquisition must have issued from unique and autonomous linguistic processes. This evidence can be organized under two general statements.

1. *The abstractness and intricacy of the language system that children learn appears to be beyond the capacity of their cognitive systems.*

The basic argument is that children could not have used their general learning strategies to construct their language systems because the language systems they learn are far too complex and abstract. The improbability of learning language solely from general learning strategies can be illustrated by the problem a child would face using general strategies such as analytic reasoning and induction to learn the relatively simple process of question formation in English. Yes/no questions are formed by movement of a word towards the beginning of a sentence as in Example 1a and 1b below. On the surface, this appears to be a simple process leading to the expectation that it could be learned simply by comparing sentences such as 1a to 1b. However, a little consideration of the nature of the process reveals its deceptive intricacy. The sentences in 1c and d indicate that the word that moves must be one that is contained within the main clause of the sentence and not in the subordinate clause (the * indicates an agrammatical sentence). Thus, there is a restriction on the kinds of clauses that will allow such movement. Sentence 1e demonstrates that when more than one potential candidate for movement is available, the word that moves is the one that contains the tense component of the auxiliary. Characterizing the destination of movement also requires some elaboration. The destination is not defined by a particular ordinal position in a sentence (first, second, or third) but by the position of the subject NP (noun phrase). Hence, in sentences like 1f, the element does not move to the sentence-initial position but the pre-subject NP position. Notice in the preceding discussion that the terms *main* and *subordinate clause*, *tensed* and *untensed auxiliary*, and *subject NP* were needed to describe the behavior of question movement. These terms themselves represent abstract grammatical concepts that must be understood by a learner of question movement before the behavior of the movement itself can be analyzed by a child.

Example 1.

- a. The man is running.
- b. Is the man running?
- c. The man who is standing by the door is watching.
- d. *Is the man who standing by the door is watching?
- e. Could the man be watching?
- f. After hearing about the injuries associated with skiing, do you still want to go to the ski resort this weekend?

Besides these English specific restrictions on movement, there is a universal restriction that can be recognized only if one observes the behavior of movement rules (actually any rule) in other languages. This restriction is that rules must be *structure dependent*, that is, the behavior of the rule can only be described in terms of the structure of the sentence to which the rule applies and cannot be described in terms of the nonstructural features of a sentence, such as the ordinal arrangement of words. For example, no language contains a movement rule that would permit a unit to move from its position as the third word in a sentence to the first word position. While such rules seem to be inherently plausible, and, in fact, would seem a likely hypothesis for a child learning English question movement rules, they appear to be completely prohibited in languages and they are unattested in language acquisition data. Thus, some of the intricacies of the question movement rule of English are shared by all languages, and some are shared by relatively few. A learner of English or any language has the formidable task of learning a set of structure dependent rules and a set of corresponding restrictions in order to command just one of the many grammatical systems of a language. This task would appear to be impossible to perform by a child who had to learn such systems through analogical reasoning and problem solving alone. The fact that normal children begin saying sentences with question movement before the age of three seems to be uncontested evidence that they are using more than their cognitive abilities to acquire these rules. As will be expanded upon later, the source of this additional help is claimed to be in a language module of the mind.

2. *Children learn principles about their language that are not present in the input.*

The basic argument is that children appear to know certain things about language that could not have been derived from input they receive. This argument, again, leads inevitably to the conclusion that children learn by means other than those embodied within their general cognitive abilities. The evidence for this argument is quite pervasive. The universal restriction on rules discussed earlier is a clear case in point. There is nothing in the input that informs a learner that rules must be structure dependent. The learner should be equally as likely to hypothesize an ordinal position rule as a structure

dependent rule. Of course, as indicated, an ordinal position rule would be a wrong hypothesis for the learner of any language, but a novice learner who, by hypothesis, has nothing but general cognitive resources with which to analyze input should have no way of knowing about universal restrictions. Such restrictions, by their very nature, could not be contained in the input from a single language. Thus, children should be willing to accept an ordinal position rule as the outcome of their analysis if they are truly approaching the learning situation unaware of the universals of language. The fact that every child in every language frames the same general solution — a structure dependent rule — is evidence that more than analytic reasoning is at play (Chomsky, 1988).

Since the source of this single solution cannot be in the input nor a product of their analytic processing of the input, it must be concluded that it derives from some pre-established bias about the possible forms that language can take. Such a bias must emanate from a specialized module of the mind because it would seem to be useful only for learning syntax. Certainly, there are analytical problems that a child will face outside of the realm of language that would require an ordinal position solution. Thus, the knowledge would seem to be uniquely suited for language acquisition.

The Linguistic Hypothesis

The alternative to the reduction hypothesis that will be presented is one that follows the framework of Chomsky's Government-Binding Theory (GB) and extends the theory to issues of language teaching (Chomsky, 1981a; b; 1982; 1986a; b; 1988). Within this framework, language acquisition is viewed as an interaction between innate principles of language and the input the child receives from the environment. These two sources conspire to determine the nature of the adult language that a child eventually acquires. The language learning process is thus quite distinct from types of learning associated with general cognitive or perceptual domains in that it is served by specialized innate knowledge that is uniquely linguistic and that would be of no benefit to any other kind of learning. This innate knowledge or universal grammar (UG) is sufficiently abstract to guide the acquisition of all languages.

The UG is conceived as a set of principles that define the common attributes of all languages and a set of linguistic options or parameters that define the finite variation that is allowed among the world's languages. When acquiring a specific language, a child constructs a grammar that adheres to the principles of UG by selecting among the options made available by the parameters. All children begin with the same grammar, a universal grammar, which they will change according to the language input that they experience. For example, the Structure Dependency principle already discussed is a

principle provided by UG that insures that the language a child constructs has no structure independent rules. While principles ensure that all languages are the same in some aspects, parameters allow languages to have some degree of variation. Children find information in the input language that enables them to select the among a set of options to construct a grammar that corresponds to the adult language. For example, the innate system allows a child to decide between two options (i.e., set a parameter) concerning the structure of verb phrases (VP), noun phrases (NP), prepositional phrases (PP) and adjective phrases (AP) (Chomsky, 1981). The option concerns whether the head of a phrase (the verb is the head of a verb phrase and the other kinds of phrases follow this pattern) precedes or succeeds the rest of the phrase. The English learner selects the head-first option thus creating a grammar that has only head-first phrases. This grammar would specify that PPs have prepositions first and VPs have verbs first, adjectives precede their complements (AP) and nouns precede relative clauses (NP). The triggering of this parameter, called the Head Parameter, can be accomplished by the learner receiving sufficient evidence that the head is first in any one of the four types of phrases. A Japanese learner, in contrast, sets the parameter to the other option based on sufficient evidence that heads of phrases occur phrase-finally in Japanese. By setting this and other parameters given by the UG, the learner creates a series of intermediate grammars each of which is a closer approximation of the adult grammar. Language learning, thus construed, is a process of progressively narrowing the distance between a child's intermediate grammar and the adult grammar. This movement is driven by a set of narrowly defined, innately given questions (parameters) about the nature of the input.

Even within this highly structured acquisition model, there need to be provisions made to account for inevitable aspects of language that do not follow patterns, phenomena such as irregular verbs. Provisions must also be made to allow a child to have some mechanism with which to identify triggers in the input. A learner within this model is compelled to presume a highly regular and exceptionless language by the broad scope of the principles and parameters of UG. Because actual languages have irregularities and exceptions, these have to be learned by analytical capacities that may be more closely aligned to general cognitive abilities (Jaeggli & Safir, 1989). In addition, methods for finding triggers in the speech stream of a particular language cannot be entirely provided by the UG. Initially, all that a child obtains from the sound stream is a sequence of speech sounds and, possibly, a clustering of sounds into longer units. Because the UG must provide information for learners of any language, it cannot, as it is presently conceived, identify which parts of the stream are trigger material for the learner of a particular language. Thus, before the parameter setting process can begin, units in the speech stream must be correlated to meaning. This process may in-

volve some perceptual and cognitive processes that are not linguistic specific as well as some that are (Pinker, 1984; Wanner & Gleitman, 1982). The output of this preliminary analysis would then be used to identify the triggers for the syntactic options that guide the deductive acquisition of a specific language.

Relating Linguistic Theory to Language Testing and Teaching

The implications that this theory may have for clinical work are revolutionary. The theory has the potential for changing the basic definition and understanding of language disorders and the kinds of activities performed in language testing and teaching activities. Take, for example, how the theory might affect the interpretation of the current definition of a language disorder. The commonly accepted definition can be stated as follows: a language disorder is a difficulty acquiring language as demonstrated by a level of language development that is not commensurate with chronological or mental age. The stipulation that there is a delay in the level of language development is typically interpreted to mean that the language of a language impaired child is a simpler version of English. This logic follows from the assumption that language is acquired in stages or levels and that each successive level is more complex and abstract than its predecessor (Brown, 1973). A GB interpretation of the delay would differ on this very assumption. Given a UG model, there is no theoretical need to assume successive stages of development, at least not in the sense that stages proceed from simple to complex or from concrete to abstract. The most common assumption about development from the GB perspective is that children do not learn to make their language progressively more complex or abstract but rather they learn a series of (intermediate) equally complex and abstract grammars that are progressively more similar to the adult input language (Hyams, 1987). Thus, an intermediate language would not be described as simpler or less abstract than the adult language but rather as a *wrong* language. A wrong or intermediate language is a possible human language that is learned by a child but is not the adult input language. The child is in no sense wrong in learning the language because the language is the right language given the input data that the child has analyzed.

Labelling the language of a language-disordered child as the wrong language rather than as a simpler or less-abstract language has far reaching implications for teaching. Under this model, the goal of teaching would be to stimulate the learner to change grammars, that is, to choose the right or input language. The process for achieving this end would necessarily be different from one for achieving the more traditional goals associated with the simpler language approach. The goal of this latter approach is to teach children to

add more complex or more abstract elements to their language. Teaching methods designed to meet this goal usually direct the learner's attention to those parts of English that are missing from their sentences. The learner is usually given many opportunities for hearing the missing forms and experiencing their meaning. In some paradigms, positive feedback is given when the elements are used by the learner. Such methods would be precluded on principled grounds from the wrong language approach for the surprising and seemingly counterintuitive reason that the UG may prohibit the learning of some missing elements. It would be further stipulated that any elements that are prohibited from a language by UG would be difficult to learn. Casting the argument in terms of natural languages, it may be that Chinese not only does not have an agreement system, but also could not attain one while maintaining all the other aspects of its system. Languages like Chinese and certain intermediate grammars of English might be prohibited from having agreement systems by the very nature of their structure. Assuming this to be true, this would mean that a child might not be able to gain an agreement system by adding one to the existing intermediate language. In order to obtain an agreement system, the child may have to change the grammar to one which UG allows to have such a system. In other words, the process of learning certain language systems may have to be predicated on a change to a grammar that licenses the system in question. While it would be counterintuitive to claim that there is a prohibition against learning certain language systems, it seems to be quite logical to claim that certain language systems cannot be added to certain grammars.

The method for teaching that is compatible with UG theory would be to direct the learner's attention to trigger information that would reset a parameter making possible a change in grammars. If the appropriate parameter were reset, the resulting new grammar would be one which would allow the addition of the grammatical elements in question. As will be demonstrated later, the triggers may not have any direct relation to the effect on the grammar that they engender. The trigger may involve an aspect about one part of the grammar, for example the subject-verb agreement system, and the change that results may have influence on another part of the grammar, for example, the realization of the subject NP.

From a UG perspective, other approaches to clinical language teaching are not so much wrong as they are premature. As part of its focus on teaching missing elements, these other clinical methods place emphasis on giving the learner information from which to learn target sentences. The teacher's task is to sequence the information into attainable steps giving the learner ample opportunities to experience the form and the meaning of the elements to be learned. As argued, such a process would only be appropriate after a child changed to a grammar that is licensed to contain the elements taught.

The step that would precede the more traditional approach to teaching could be described as trigger input management. Managing the input for this purpose does not simply mean presenting ample opportunities for a child to experience the form and the meaning of elements to be taught. Rather it would involve providing the precise input information that the child needs in order to reset a particular parameter. In order to reset a parameter, the learner needs specific information that essentially contradicts the current setting. The teacher cannot teach the child how to change, but rather the teacher can convince the child that a change is needed. The change itself would be controlled by the UG. Thus, the teacher cannot control the change process in any real sense; the UG knowledge that the input triggers is the controller.

To summarize, attempts to provide models of target elements that are missing in a child's language may be completely useless at the beginning point in the language teaching process. The child needs to select a UG given language that is compatible with the target elements first, and then the input on the form and meaning of the elements can be of some benefit.

One direct way for a teacher to help a child reset a parameter would be to artificially highlight and emphasize those aspects of the input that contain trigger material and de-emphasize those aspects that do not. Because normal children learn language on their own, it is obvious that they do not require such assistance (Connell, 1987). The failure of language impaired children to learn language on their own as rapidly as normal children is a clear indication that they may.

Thus, teaching could be defined as a process of managing input to allow abnormal learners an opportunity to abstract the kind of information needed to change their grammars appropriately. It might be said that the input manager's role is to set the table for the feast. Much like the chef who prepares excellent food but cannot directly control the complex digestive process of his customers, language teachers can prepare excellent language information packets, but they cannot affect the process of acquisition.

Taking on a language input manager role rather than a language teacher role has implications for structuring a therapy session for an individual client. For example, consider a child who says sentences like those in Example 2, taken from a 4 year, two-month old child diagnosed as having a language disorder. The missing copula *be* in 2a, third person singular inflection in 2b, auxiliary *be* in 2c, and subject NP in 2d are commonly found in the language samples of such children. The usual clinical approach would be to classify these characteristics as errors and teach the correct forms. A common teaching method is some sort of drill in which the child imitates sentences that contain these elements or some kind of

directed language experience in which the child is exposed to a higher than normal frequency of such sentences or some combination of the two. The rationale for these approaches is that increasing the amount of exposure and practice opportunities makes learning more rapid.

Example 2.

- a. This Tracy
- b. This say Tracy
- c. I going somewhere after this.
- d. Putting it right here.

The UG model would make entirely different assumptions about what is wrong and what should be taught to this child. Since the child's problem is not viewed as one of not saying certain elements but one of having a grammar that is not enough like English, the focus would be placed on changing grammars. The missing elements are not viewed as errors that have to be rectified in the same way that an English speaker's lack of case endings on nouns, as is done in Latin, is not viewed as an error. Therefore, the explanation for the fact that the child's sentences in Example 2 are missing certain elements is simply that the child's grammar does not generate them, and his grammar does not generate them simply because the grammar is not adult English.

This definition of what is wrong with the child's language leads to a general plan about what can be done to change it. The teaching approach that is needed is one that helps the child create a grammar that generates these missing elements. The first step in constructing such a method is to define the difference between the child's grammar and English in terms of a parameter, and the second step is to define a means by which to trigger the parameter. From Example 2, it appears that the missing elements fall under the aegis of what has been called the Null Subject parameter.

Teaching a Non Null Subject Grammar

Before describing the details of a possible teaching approach, some general comments on the advisability of using theory based teaching in clinical settings are in order. One apparent drawback to performing such teaching is that the theoretical accounts of language acquisition are in a state of evolution. This is especially true of research using the UG framework. The theory has spawned an unusual research interest in acquisition mainly because it makes specific predictions about acquisition that can be tested. But because it is a rapidly developing theory, there is uncertainty about the eventual status of some components, and this uncertainty makes application somewhat premature. The general position, however, that theory based teaching should be withheld until theories

gain conclusive empirical support seems to be a bit too conservative. First, no matter how accepted they have become in the field, all approaches presently taken to teaching abstract syntax to children are based on inconclusive and unestablished theoretical models, most notably on the reduction hypothesis mentioned previously. Using a new model to support clinical teaching practice does not introduce unestablished theories into practice for the first time, it only changes the particular theory being applied. Whether or not the approach is useful to the client remains entirely the decision of the clinician. Using such methods does not necessarily deprive a child of the best teaching methods available because there is no one standard or one method that has been shown to be generally effective and applicable. Thus, there is no ethical or practical reason not to give another theory a chance as long as it meets certain criteria of acceptableness and as long as the clinician carefully monitors its effect. Further, by using the methods suggested by the new theory within the framework of clinical research designs, clinical practice can be a productive component in the theory building process.

The pattern of language errors described in Example 2 is expanded in the description in Table 1, which presents the pattern of language elements that are typically found in the language samples of specific language disordered children and normal children of a younger age. It needs to be pointed out at this juncture that it is being assumed that the process of language acquisition of normal children is the same as that for a language impaired child. This assumption will be justified and expanded in a following section.

Table 1. List of properties commonly found in language samples of SLI and normal children.

<ul style="list-style-type: none">• Missing subject NP• Missing auxiliary <i>be</i>• Missing copula• Missing third-person, singular, indicative• Missing infinitive <i>to</i>• Substitution of accusative for nominative case pronouns• No question inversion

The characteristics listed in Table 1 have been the concern of a group of people who are attempting to characterize the Null Subject parameter in theoretical work on normal children's language (Hyams 1987; Guilfoyle & Noonan, 1988; Kazman, 1988, Lebeaux, 1987). As indicated before, a parameter within the GB framework is analogous to a switch that the language learner must set in response to certain input data called triggers (Chomsky, 1988). The process of language acquisition has been characterized as a process of setting a series of parameters creating a series of grammars that

eventually lead to a steady state or adult grammar (Jaeggli & Safir, 1989). In the case of the Null Subject parameter, there are several proposed triggers and several proposals about the nature of the parameter itself (Hyams 1987; Guilfoyle & Noonan, 1988; Kazman, 1988, Lebeaux, 1987).

Originally, the parameter was proposed to characterize the regular difference found between languages concerning whether they allow sentences without overt subjects but has broadened to include other related areas of language as well. For example, in English, the sentence, *Am a walrus*, is agrammatical, but the equivalent sentence in Italian, *Sono il tricheco*, is grammatical. This leads to the generalization that Italian allows (overtly) subjectless sentences and English does not. Child English appears to be a grammar that allows null subjects but in a manner that is more similar to Chinese than Italian. Chinese, like child English, does not have the elaborate agreement morphology of Italian. The language characteristics listed in Table 1 may be in the domain of this parameter because certain natural languages that allow subjectless sentences also have these characteristics (e.g., Chinese). Interestingly, it appears that normal English speaking children (Hyams, 1987) and specific language impaired children (Connell, 1986b; Leonard & Loeb, 1988, Loeb & Leonard, 1988) begin to use overt subjects within the same time interval in which they acquire these other elements. Thus, it appears possible to characterize the grammar of language disordered and normal English speaking children at this stage as one that differs from the adult grammar in terms of the Null Subject parameter (among other aspects of grammar).

Before discussing how setting the parameter might be addressed in a clinical teaching program, some consideration needs to be given to the structure of sentences containing different kinds of NPs that serve as the subject of sentences in adult English and other languages. The sentence in Example 3 has an NP that can be called an overt subject. This kind of subject will be contrasted to silent subjects that can occur in other languages. In Example 3, the subject John is a type of NP called an *r-expression* in GB. Among other possible reasons, the speaker of this sentence might have used the *r-expression* John to convey the information that John is being introduced to be the topic for the ensuing discourse. Thus, one pragmatic function of *r-expressions* is to establish a new discourse topic. If John were already the discourse topic, reference to him would best be accomplished by the pronominal *he*, a second type of NP. That the discourse topic up to the point at which this sentence occurred in the conversation was something other than John (thus making John preferred over *he*) is denoted by the term *other* in the discourse topic slot preceding the sentence in Example 3. Placed beside it is a slot for the sentence topic. The sentence topic is what a particular sentence is about in contrast to the discourse topic which is what the conversation is about at any one point. What is

important to note about this description is that the NP subject of the sentence is not referring to the discourse topic. That is, the sentence can be said to be about the person whose name is the subject of the sentence but whose identity is not what the discourse has been about until this point. These are the conditions that set the stage for a noun like *John* to be the subject of the sentence.

Example 3.

Discourse Topic: other
Sentence Topic: John.
John is walking the dog.

The referring relationship between the subject NP, the sentence topic, and the discourse topic differentiates this situation from that which allows a pronoun to serve as the subject as illustrated in Example 4. What is different in this case is that there is coreference between the two topics and the subject, that is, they all refer to the person John. The conversation at this point is about John; this particular contribution to the conversation is a comment about John that fits into the ongoing discourse, and the subject of the sentence is an NP that refers to John. These conditions dictate that the subject NP must be realized as a pronominal. Thus, one of the conditions that allow subject pronominal reference in English is a three-way coreference of the two topics and the subject. It is also possible to obtain such reference when the sentence topic is overt as in Example 6. The importance of this point will be made clear later.

Example 4.

Discourse Topic: John
Sentence Topic: John
He is walking the dog.

Some languages like Italian allow for the generation of another type of NP called *pro* rather than a pronominal in situations such as in Example 4 in which three-way coreference occurs. Such languages have been called Null Subject Languages to denote that the subject pronoun may be dropped from the surface sentence. This situation is illustrated in Example 5. The *pro* has all the characteristics of an overt pronominal except that it has no phonetic realization, that is, it is silent. Even though the subject is unsaid in this Italian sentence, understanding the reference that the silent subject makes as unambiguous for an Italian listener of Example 5 is as understanding the reference of the pronominal in Example 4 for an English speaker. Reference in both cases is said to be chained to the discourse topic. In the Italian case, there is agreement morphology attached to the verb that can help identify certain characteristics of the subject. In this case, it is a third person singular suffix. Such morphological informa-

tion is not necessary in all Null Subject languages. For example, in Chinese, no morphological information is available because there is no agreement morphology, but the identification of the referent of *pro* presents no problem. The discourse topic is always identified as the referent in such cases.

Example 5.

Discourse Topic: Mario
Sentence Topic: Mario
Telephona Sophia.
(He) telephones Sophia.

Thus, English and Italian and Chinese are said to differ parametrically in their use of either subject pronominals or *pro* in situations in which there is three-way coreference. The parameter that differentiates them is called the Null Subject parameter. The purpose of the parameter from a learner's perspective is to specify whether the grammar that is being constructed will allow *pro* in the subject position as in Chinese and Italian or disallow *pro* as in English, French, and German. The sentences of the SLI child presented in Example 2 and the characteristics of the sentences of SLI and young normal children presented in Table 1 coincide with the characteristics of a Null Subject grammar that is much like Chinese in that there are sentences with no spoken subjects, and there is no agreement morphology, such as copula *be*, auxiliary *be*, and *third-person singular*.

Recently, there have been several proposals put forth about the nature of the parameter that differentiates Null Subject from Non Null Subject languages and child English from adult English (Hyams; 1987; Kazman, 1988; Lebeaux, 1987; Guilfoyle & Noonan, 1988). What these proposals have in common is the notion that children begin learning under the assumption that language is a Null Subject language, even if it is not. Children who learn English will have to reset the parameter at some point to accommodate the input, while children learning Chinese will not have to. The process of resetting the parameter is under investigation and is intimately tied to research on the nature of the parameter itself and what its setting entails. The question of importance to clinicians and teachers of language disordered children is how to reset the parameter. The proposals for resetting the parameter appear to be quite complex.

According to all accounts, the child who has a grammar that has the wrong Null Subject setting for English also has no mechanism within the grammar for representing subject-verb agreement or the tense of verbs. Under one approach, the parameter controlling the Null Subject setting is triggered by information about the verbal morphology of the input language. Although methods based on this approach have not been tested experimentally, it will be argued that the success

of such a clinical procedure would be guarded for reasons that will be discussed. An alternative method that has been tested in a preliminary fashion will be presented. This method approaches the triggering process from a different perspective and hence overcomes some of the anticipated difficulties of the first approach.

The first approach follows Hyams' (1986) and Jaeggli and Safirs' (1989) work on the Null Subject parameter in which the licensing of *pro* in a language is determined by the uniformity of the verbal morpheme system. It seems that languages with uniform systems allow *pro*; languages with nonuniform systems do not. In recognition of this pattern, it would seem appropriate to teach English children that English has a verbal morphology (the progressive suffix, the past-tense suffix, the present-tense suffix for third-person singular) because it is assumed that they have a grammar like Chinese that has no verbal morphology. Providing sentences that contain a contrast between verbs like *plays* and *played* using an induction sort of procedure outlined in Connell (1986a) could teach a child that verbal morphemes are used in English. In this procedure, contrasts such as the variable relation between the time-of-event and the time-of-speech (e.g., *he walks* versus *he walked*) and the recurrence versus the single occurrence of an event (e.g., *he is walking to work* versus *he walks to work*) are demonstrated by pictures or physical enactments. The learner hears these contrasting sentences, views the contexts that substantiates their meaning, and is asked to repeat the sentences. The evidence provided in Connell (1986a, 1987) suggests that repetition of sentences by language disordered children facilitates learning the contrasts presented. It seems that such repetition allows the abnormal learner more of an opportunity to inspect and find patterns in the input sentences and thereby learn from the input. The goal of such teaching would be to inform the learner that the grammar has a mechanism for representing tense and agreement so that the present grammar can be changed.

Unfortunately, the change in grammar that might ensue from this procedure would be to a grammar that may not be a Non Null Subject language, since languages like Italian have a complex agreement system and Null Subject language. According to Hyams (1987), what a learner needs to learn about English is not that it has a verbal morphology but that the morphological system that it has is not uniform, that is, that not all verbs in English sentences are marked with a suffix. Thus, not only would the learner have to create a grammar containing abstract elements, such as tense and agreement, that are not represented in the presently held grammar, but also would have to learn that these elements are not uniformly realized as verbal morphemes in English. Once a grammar such as this is constructed, it is hypothesized that it can be only a Non Null Subject language like English (Hyams, 1987).

On the face of it, it seems difficult to conceive of a teaching method that would inform the learner of the existence of a verbal morphology and, at the same time, inform the learner that the verbal morphology is not uniform. It is unclear how to give an SLI child the kind of input that would allow for the construction of just the kind of grammar specified above for English following the morphological uniformity route. One possible avenue that may bring the learning of SLI children more in line with normal children is to more or less force their grammars to change. As indicated from the results of the experiments on the language learning capabilities of SLI children (Connell, 1986a, b; 1987), what they need to make them learn at a more rapid pace is a teaching program that requires them to say carefully constructed sentences while observing events that represent their meanings. Given that it appears to be difficult to construct a program around those language aspects that are hypothesized to provide normal children with the data necessary to reset the parameter, a nondevelopmental avenue may be necessary.

The avenue that proved to be successful in a teaching experiment with SLI children (Connell, 1987) involved teaching children to say a set of sentences that did not fit into their grammars that allowed Null Subjects and led them to adopt a grammar that did not allow Null Subjects. The assumption underlying the method is that teaching that is directed towards resetting a parameter for an SLI child may need to be fundamentally different from the natural process of resetting a parameter due to the limitations imposed by the limited context of teaching and the limited capabilities of the learner. The prediction tested was that SLI learners who were taught to say sentences that contain elements not represented in their grammar could change their grammar. Because the anticipated change was parametric, that is, the change involved selecting a Non Null Subject language in place of a Null Subject language, such a method might be successful. Thus, it was predicted that learners of this type will reset a parameter as a result of learning to represent sentences that could not be represented under their previously held grammar. This process of grammatical change is proposed only under circumstances in which the anticipated change is under the domain of a parameter.

Evidence in support of this prediction can be found in the results of a teaching study involving four SLI children (ages 3:5 to 4:2) who were using either *pro*, an *r-expression* (a name), or an accusative case pronominal in the subject position of their sentences as illustrated in Table 2. The samples of these children were similar to that of the child whose sample is depicted in Example 2 and similar to the characteristics listed in Table 1. The teaching procedure involved having the children say sentences that contained two overt pronominals in the preverbal position such as in Example 6. One of the two pronouns in this sentence could not be represented in a gram-

mar that allowed Null Subjects as characterized by Hyams. According to Hyams, *him* in b, *Ben* in c, and *dinosaur* in d of Table 2 are all realizations of the sentence topic, not the subject. The subject of these sentences is the silent *pro* that would be possible in sentences like these in Chinese. The fact that the pronoun has the accusative (objective) case rather than the nominative (subjective) case is used by Hyams to support her claim. The context depicted in Example 6, in which an overt sentence topic is realized as a pronominal, is another kind of context that allows either subject pronominal or *pro*, depending on the status of the Null Subject parameter setting. Because the overt topic pronoun introduces the referent (the girl) to the discourse in this sentence, the subject would be required to be a pronominal in a Non Null Subject language or a *pro* in a Null Subject language. Thus, a child like the one who produced the sentences in Table 2, who apparently has a Null Subject language, could not represent the two preverbal pronominals in Example 6. Such a sentence would be ungrammatical because a subject pronominal is used in a context in which the referent has been previously established. An English speaker, on the other hand, would have no difficulty representing both pronominals. By teaching the children who had a Chinese-like Null Subject language to say sentences like those in Example 6 in an appropriate context and ensuring that they understood the coreference between the two pronouns, it was predicted that they would be forced to reset the Null Subject parameter to an English-like setting and thereby create a grammar that would not allow *pro*.

Table 2. Different kinds of NP in the subject position of sentences spoken by a group of SLI children.

Example Sentence	Subject NP type
a. (I) Put it on him.	Null (<i>pro</i>)
b. Him put it.	Accusative pronoun (pronominal)
c. Ben need this car.	Own name (<i>r-expression</i>)
d. Dinosaur hiding.	Noun (<i>r-expression</i>)

Example 6.

Discourse topic: Kids in the park
 Sentence topic: A little girl
 Her, she is petting the fawn.

The children were taught to represent the sentences in question by an induction approach. They were taught to say two sentence types of the form *Her, she is petting the fawn* and *She is petting the fawn* in contexts that emphasized the potential difference in their interpretation. The difference that was emphasized was the use of the accusative pronoun (sentence topic) to refer unambiguously to a person in a crowd of

people. For example, a picture depicting a crowd of people standing around a fawn with one of them, a little girl, petting the fawn, was used to provide the children with an interpretation of the sentence in Example 6. The teacher asked the children, "Which one is petting the fawn?" and taught the children to answer "Her, she is petting the fawn" and to accompany this answer with a pointing gesture towards the girl in the picture. This situation was presented in contrast to a second picture of the same girl by herself petting the fawn. The teacher asked, "What is she doing?" and taught the children to answer, "She is petting the fawn." The expected effect of teaching was to make both the sentence topic and the subject both overt pronominals with obvious grammatical and pragmatic functions thereby forcing the children to interpret a sentence that their currently held grammar could not represent. It was predicted that this would demonstrate to the children that *pro* cannot occupy the subject position and, as a result, cause them to reset the parameter to disallow subject *pro*.

The results of the teaching program, which are summarized in Table 3, support the prediction. The children began to use nominative case pronouns in the subject position of sentences and to use overt NPs in all sentences spoken in conversational speech as the first indication that they were changing their grammars. The second step was to include tense and agreement markers in their sentences. This two-step change would make sense from Hyams' characterization of the parameter in that the agreement and removal of *pro* are related. The later acquisition of the agreement and tense morphology would be explained by the need for the children to learn the agreement and tense forms in English once they have acquired a grammar that can represent them, while the process of disallowing a *pro* would require no additional learning.

As must be evident from the above, structuring teaching around parameters is at best a tenuous business. Since the exact nature of a particular parameter is currently a matter of theoretical debate and because it will require time before the picture is clearer, the usefulness of parameters for current teaching practice is somewhat limited. At present, the model allows glimpses into what the future might hold for clinical language teachers. Even within these limitations, however, the model offers very practical guidelines. It offers the concept that language teaching is more than teaching children to say adult-like sentences, rather it is a matter of teaching a child to change a grammatical system. It also offers a rationale for discarding behavioral methods of teaching language in which responses are reinforced or punished for the sole purpose of either increasing or decreasing their frequency. The frequency of responses is not an issue to a teacher who is teaching a child to change a grammar. Feedback may, however, have some role to play once the grammar has changed to one that is compatible with the elements being taught. The model also offers an explanation for why certain patterns of

Table 3. Typical sentences representing the three stages of change of children taught to reset the Null Subject parameter.

Stage	Sentence Types
Pre-teaching	Me going there. (I) Have this one.
Mid-Teaching	I going to store.
Final Teaching	I am going now. He wants one. Can I take it?

language occur in language disordered children's samples and some suggestions about how this information relates to teaching. Lastly, it offers an approach to language teaching that is specialized for language and is not simply a remodelled version of approaches used to teach other aspects of human development.

Given the considerable ground that has been covered thus far, it seems appropriate to summarize what has been presented with an analogy that provides a general picture of language acquisition, impairment, and teaching within a UG-GB model. Language acquisition can be conceived as a journey that children make from a common origin to several possible destinations (possible human languages). The UG provides the road map to all these destinations and a means for making decisions about which way to go when a fork in the road is encountered (parameters). The routes on the map radiate from the common origin and end in a number of separate destinations (finite number of possible languages). Each of the central roads radiates into a succession of branches in arterial fashion. The traveller on these roads encounters the highway system as a series of crossroads (parameters) with spaces between them. At each crossroad, the traveller makes a decision about which way to go. There are two types of crossroads encountered by a traveller: attended and unattended. The novice traveller (beginning learner of a first language) only encounters unattended ones; more seasoned travellers encounter the attended ones. Unattended crossroads present no problem to a traveller because one direction is always easier or is the more preferred route than the other (unmarked or default setting of a parameter). Thus, for novice travellers, the journey always ends at the same destination — that which is at the end of the road that winds through the most travelled routes at every intersection (and unmarked or UG language).

Soon after novice travellers complete their journey, they find that they have ventured to the wrong place. A long distance call from a newly hired attendant (parents, other

care-givers, and significant others) at one of the crossroads that they had passed along their way informs them that they took the wrong road and that they must return to that crossroad and begin the journey anew (reset a parameter). It seems that many of the crossroads are becoming peopled by attendants who make phone calls (triggers) telling travellers that they need to take the least travelled (more marked) rather than the customary route. The attendants that children encounter at these crossroads happen to live at the child's eventual destination (speak the language being acquired). These attendants could give the directions for the entire journey to the child, but an immature traveller is incapable of following more than one instruction at a time (sets one parameter at a time) and must travel customary routes to a new destination that is only one crossroad closer to their eventual destination (adult language). The process repeats itself until each crossroad attendant who discovers a mistake is heard from, at which point the ultimate destination can be reached.

Given the evidence that is available about various types of language impaired children (Rosenberg, 1984), such children appear to take the same circuitous route to the adult language as normal children; the factor that marks them as disordered is that their travel time is always greater. This conclusion implies several things about language disordered children's acquisition of language. First, they use the same map or UG as normal children, otherwise their intermediate grammars would not be the same. Thus, all the same roads, crossings, and destinations are indicated. Secondly, the sequence of resetting parameters is the same, otherwise the sequence of intermediate grammars would not be the same. Thus, the attendants give them the right kinds of information to reset mistakenly set parameters. This leaves the timeliness of the triggers as the most likely place for the difference to lie. Language impaired children must have problems in readily identifying triggers in the input making them unable to change their grammars within an appropriate time period.

The teaching approach that has been advocated here is one that makes a trigger more salient to the learner. The saliency obtained is a product of having the learner understand and say contrasting sentences in which trigger material is highlighted. The requirement that they need to say as well as understand the contrasting sentences for learning to occur may indicate that their basic problem with identifying triggers is an inability to hold in memory a mental representation of the structure of a sentence for a sufficient time to allow for analyzing the critical parts of its structure. Thus, the saying of sentences may provide them with a more prominent memory of the structure, thus allowing for an analysis of the trigger information.

In this kind of teaching, feedback has some role to play, although the role is quite secondary to the goal of teaching. Feedback, for example, can be used to inform learners about

how well they are approximating the form of the sentences given for repetition. As indicated, it appears to be more effective for abnormal learners to say elements in the sentence that contain the trigger material. This type of feedback does not provide input about the language elements to be learned, it only helps to provide the learner with a more prominent perceptual image of the structure of the sentence. Thus, the feedback is used to teach learners to say sentences aloud so that they can use their UG driven linguistic analysis methods to identify the trigger and set a parameter. Feedback could have no more central role because the route to the ultimate destination is fully determined by the UG map and the attendants at the crossroads. The UG is in the mind and the attendants' directions are merely whether to go left or right.

The future presaged by this model is quite different from a past in which nonlinguistic models governed language evaluation and teaching. Knowledge of cognitive development and perceptual capacities will assist these new teachers, but they will rely more heavily on their understanding of the parameters that govern the change of grammars and the triggers to which these parameters are sensitive. Lists of language achievements that comprise classic stage descriptions of language will be viewed as epiphenomena of the actual mechanism of linguistic change and will be given only minor importance. A teacher's goal will be to overcome the impediment language impaired children have in identifying appropriate triggers, thereby allowing them to use the UG to its fullest extent. Such teaching would bring into consonance theories of language acquisition and theories of language teaching.

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