On the pro-drop parameter as a language acquisition theory

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1. Introduction

Children's very early speech has been characterized as "telegraphic". They leave out, or only inconsistently include, a variety of constituents in their utterances, among them subjects, determiners ("a", "the"), modals ("can", "will", "may"), the copula "be", and so on.

These omissions in children's early speech have received great attention, and a fairly good number of analyses have been proposed. Nevertheless, there are still controversy on this phenomenon. In this paper, I focus on the frequent absence of lexical subjects in early language.

The purpose of this paper is to examine and evaluate parameter-setting theory of language acquisition, as applied to the so-called pro-drop parameter hypothesis. I first give a brief introduction of the parameter-setting hypothesis and then examine what is the pro-drop parameter and how it can be applied to language acquisition. Finally, I point out some problems of the pro-drop parameter hypothesis as it applies to acquisition.

2. General background of the parameter-setting hypothesis

A child, according to Chomsky (1965), is born with an innate hypothesis-making device, which enables him to make increasingly complex theories about the rules of the language he is exposed to. In making these

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hypotheses, the child is guided by an inbuilt knowledge of language universals. These provide a 'blueprint' for language, so that the child knows in outline what a possible language looks like. There may be more than one possible set of rules which will fit the data. At that time, Chomsky suggested that the child must in addition be equipped with an evaluation metric which would allow him to choose between a number of possible grammars, that is, some kind of measure which would enable him to weigh up one grammar against another, and discard the less efficient.

However, Chomsky's earlier simple scenario failed primarily because the evaluation device proved elusive and unrealistic, which left unanswered the question of how a child might narrow down the enormous number of possible grammars. The shift from the earlier conception of universal grammar (UG) in terms of rule systems to a principles-and-parameters model is an attempt to deal with the problem.

According to Chomsky (1986), UG is no longer considered as providing a format for rule systems and an evaluation metric. Rather, the rules of grammar, or the 'principles', are specified as a part of the innate. The rules, however, are slightly 'under-specified' -- that is, certain 'parameters' are left unspecified, to be filled in by the child according to the language he is exposed to. So, instead of selecting a rule from a space of infinitely many rules of some rule writing system, the child simply sets the value of an open parameter in some rule already given in UG, and thereby derives a language particular rule. The grammar of a particular language can be regarded as simply a specification of values of parameters of UG, nothing more.

> The system is associated with a finite set of switches, each of which has a finite number of positions (perhaps two). Experience is required to set the switches. When they are set, the system function. The transition from the initial state S to the steady state S is a matter of setting the switches. (Chomsky 1986: 146)

The idea of language acquisition within the model of the parameter setting is quite simple. There are finitely many parameters and each has a finite number of values. A child makes a choice of one or another of the possible values for a particular parameter at an early stage of acquisition, and the choice can be reversed at a later stage on the basis of evidence not available or unused at the earlier stage.

In the following section, I describe one major parameter in the parameter-setting theories, the so-called pro-drop (or, null subject) parameter. Then, I present how it applies to language acquisition.

3. The pro-drop parameter as a linguistic theory

The null subject of a tensed clause is called pro. The pro-drop parameter refers to the dichotomy between those languages (e.g. English, French) which require overt surface subjects in tensed clauses and those (e.g. Italian, Spanish) which allow null subjects. Speakers of pro-drop languages omit pronominal subjects of sentences, provided that the subject can be recovered from pragmatic and/or inflectional information.

As an example, in English, (1) is grammatical while (2), which has no overt subject, is not allowed.

(1) He eats an apple.
(2) *Eats an apple.

In contrast, in Italian, both (3) and (4) are allowed.

(3) Mangia una mela.
　　'Eats an apple'
(4) Lui mangia una mela.

'He eats an apple'

The pro-drop parameter in principle also controls other language features in addition to whether an overt subject is required. For example, languages that allow null subjects typically do not have "expletive", referentially empty pronouns, as shown in (6), which is the only Italian equivalent of (5).

(5) It seems that John is very unhappy today.

(6) Sembra che Gianni sia molto infelice oggi.

   'Seems that John is very unhappy today'

Certain striking differences in the auxiliary systems of pro-drop and non-pro-drop languages are also known to be closely related with the pro-drop parameter: In English, the modals constitute a separate constituent from the VP, and appear under AUX; in Italian, on the other hand, the modals *potere* 'can' and *dovere* 'must' exhibit all the syntactic and morphological behavior of verbs, that is, they are main verbs. In other words, there is language variation with respect to whether AUX may contain lexical material, and this variation is derivable from the pro-drop parameter.

In the next section, I present Nina M. Hyam's argument for the setting of the pro-drop parameter in accounting for children's early speech.

4. The pro-drop parameter as an acquisition theory

Hyams (1986, 1987) points out that subjectless sentences in early language share two important properties with adult pro-drop languages, arguing that these two properties constitute prima facie evidence for a pro-drop analysis of subjectless sentences in child languages. First, the lexical subjects are entirely optional, as illustrated in (7).

(7) Throw it away   Mommy throw it away

    Read bear book   Kathryn read this

    Want go get it   I want take this off

    Change pants   Papa change pants

    Push Steve   Betty push Steve

    No like celery, Mommy   Kathryn no like celery

Second, the 'missing' subject has a definite pronominal reference which can be inferred from context, as illustrated by the following dialogue.

(8) (Eric has just eaten an apple)

    Mother: You ate the apple all up.

       There is no more apple.

    (Eric starts to cry and hits the toys)

    Eric: Want more apple.

In (8) it is clearly Eric who wants some more apple and not some unspecified individual.

Hyams argues that the missing English subjects cannot be due to a performance limitation on sentence length since subjectless sentences co-exits with sentences containing overt subjects as in *Throw it away/ Mommy throw it away*. Moreover, while missing subjects are pervasive, sentences with missing objects are strikingly rare. An account in terms of processing or cognitive limitations does not predict such an asymmetry.

Hyams' core argument is that the first hypothesis of an English child is that English is a pro-drop language, and so allows 'null subjects', as does Italian. The possibility of null subjects is tied to the absence of modals and auxiliaries, since given the pro-drop parameter, a pro-drop language cannot contain lexical elements in AUX. She assumes that modals and contractible *be* are filtered out of the input data, due to children's innate grasp of the

structures allowable in a pro-drop language, which at this state they assume English to be. Hyams suggests that the negative elements *can't, don't,* and uncontractible *be* emerge prior to all other modals, since they are initially analyzed not as true modals: *can't, don't* as variants of the negative marker and uncontractible *be* as a main verb.

On the basis of the examined data, according to Hyams, the English modals and contractible *be* are systematically absent during the period of subjectless sentences. The modals and *be* elements emerge shortly after the point at which the child begins using lexical subjects consistently, that is, following the point at which the early grammar shifts away from a pro-drop grammar towards the adult grammar of English.

It is obvious that if the early grammar differs from the adult grammar, and former must be 'restructured' during the acquisition process and this restructuring involves a resetting of the parameter. In the case of the pro-drop parameter it is possible that once the English speaking child learns the English expletives *it* and *there*, they trigger a restructuring according to the following line of deduction. *It* and *there* are not being used for pragmatic purposes since they do not contribute to the meaning of the sentence. Thus they must be present for strictly grammatical reasons, namely, a null subject is impossible. Eventually, the child resets the parameter for the non-pro-drop languages.

This hypothesis is supported by the acquisition data, Hyams says. Expletives are absent prior to the oint of restructuring and then appear in the data at the time identified as the point of restructuring.

According to Hyams, the central claim of the parameter setting model of language acquisition is that many of the salient properties of child language are effects of the setting -- or missetting -- of the parameters of UG. Thus it makes certain empirical predictions about the shape of the early grammar.

One obvious prediction is that the early grammar will not fall outside the limits imposed by UG. That is to say that if there are certain finite number of values associated with a parameter, the early grammar will assume a value

within the possible values given by UG. Thus, it is entirely possible, a priori, for the early grammar of English to more closely resemble the adult grammar of, say, Italian than it does the adult grammar of English.

A second prediction is that the early grammar will differ from the adult grammar in the value specified along a particular parameter of UG and thus a single change of value may lead to a collection of consequences that appear, on the surface, to be unrelated.

Hyams argues that the two predictions stated above proved to be correct. As far as the pro-drop parameter is concerned, the early grammar of English children assumes a value within the possible values permitted in UG, which resultantly makes the early grammar of English more closely resemble the adult grammar of Italian than English. In addition, a single change of the value specified along the pro-drop parameter has complex consequences in different parts of the grammar that appear superficially unrelated. Thus, we can see the systematic relationships between the earlier absence and the later appearance of subjects and modals and expletives.

5. Problems

At first sight, the pro-drop hypothesis seems to be very insightful way of tying together seemingly unrelated acquisition phenomena. On close examination, however, a number of problems arise.

First, since *it* and *there* have presumably always been in the caregiver speech to which children are exposed, why did they fail to notice these elements before? i.e. why should they suddenly trigger a resetting? Regarding this problem, Hyams suggests that although the data are available in the environment, they are irrelevant prior to a particular maturation point.

Second, while Hyams uses the omission of expletives and modals as the supporting data for the pro-drop hypothesis, she does not give an account for the rest of the missing elements in children's early speech, which include

articles and preposition. Is she assuming that the other function morphemes require a separate account, while children's early omission and subsequent production of the set of function morphemes is likely to be a developmentally unified phenomenon?

Third, Hyams suggests that the negative elements *can't, don't,* and uncontractible *be* emerge prior to all other modals, since they are initially analyzed not as true modals: *can't, don't* as variants of the negative marker and uncontractible *be* as a main verb. Why should one need a syntactic explanation for missing modals and contractible *be,* given their apparent phonological insignificance: perhaps children simply assume that 'unstressed or contractible items are optional or unimportant'. The reason why Italian modals (*potere, dovere*) are retained while English equivalents are omitted, and why in English uncontractible *be,* and negative form of modals *can't, don't* are retained while all other modals are omitted may be the perceptual saliency of the retained elements which are acquired by their relative length and stress, rather than any structural knowledge of properties associated with pro-drop languages. This saliency may be far more important than any structural analysis. The systematic phonological account for children's early omissions was proposed by Gerken (1991).

Fourth, even if we accept, with Hyams, that a structural rather than a phonological explanation is required, there are still problems: the child has supposedly come to a conclusion of great sophistication, that English main verbs and modals are to be differentiated, yet has somehow failed to notice the expletive elements which will later trigger a reanalysis.

Fifth, if the pro-drop hypothesis were correct, we would predict an abrupt quantitative or qualitative change in how children use modals and expletives, a change which would occur at the same time as the large increase in the use of subjects. But, according to Valian (1991), the kind of patterned timing of emergence of elements that would be predicted does not emerge from the detailed examination of the children's productions. For example, expletives are

rarely used by American children across a broad MLU range between 1.53 and 4.38 and subject use range. In other words, there is no relationship between expletive use and subject use. It may be the case that American children use few expletives for semantic rather than syntactic reasons.

Sixth, the pro-drop hypothesis, which assumes the initial setting as the one for pro-drop languages, would incorrectly predict equal use of subjects by all children regardless of target languages. If all children have the pro-drop grammar at an early point in development, children of all languages should look the same at a comparable developmental point. This is not supported by the data in Valian (1991). Valian's study shows that American and Italian children at roughly comparable ages and levels of linguistic sophistication use subjects to different degrees: American children (MLU between 1.53 and 1.99), while not entirely consistent in their use of subjects, use subjects and pronominal subjects about twice as much as Italian children. This result, which shows different behavior among two groups, suggests that their subject omissions are not based on the same underlying mechanism, and American children are not operating with the wrong Italian value of the pro-drop parameter.

Seventh, inconsistent production in children's speech is not in and of itself a hallmark of a competence deficit. There are numerous studies which show that children comprehend more than they are able to produce, and thus indicate that children's speech does not reflect their linguistic knowledge directly. There can be little doubt that children's, at least partially, reflect their limited abilities to plan and produce speech.

Young children have a smaller working memory than do adults and memory span will result in their producing shorter utterances overall and shorter constituents within those utterances. Children's speech may depend on the interaction of the performance factors, which are related in a complicated way to the likelihood of producing an utterance of a given length. As Bloom (1990) proposes, children may omit subjects when their cognitive processing

abilities are exceeded. If the cognitive load plays a role in children's omission, we expect that complexity elsewhere in the sentence will affect utterance length: if the longer the VP, the more cognitive load is imposed, then the greater the likelihood of dropping a subject. It was confirmed by Bloom (1990) and Valian (1991) that VP length was shorter when the child used a full lexical subject, longer with a pronominal subject, and longest with no subject.

If it is true that children omit elements due to excessive cognitive processing load, then there arises a question: why do they tend to omit subjects, but not objects? there are data which suggest that children omit subjects more often than objects perhaps because processing demands are higher at the beginning of an utterance than near the end (Valian 1991).

There are ample reasons for thinking that factors independent of children's syntactic competence are at least partially, if not wholly, responsible for children's omission of subjects in particular and of syntactic elements in general. These factors may include characteristics of the input, processing or cognitive limitations, and prosodic effects.

Finally, as Valian (1991) points out, many acquisition theories including the pro-drop hypothesis have been limited by the weakness of the data they have had recourse to. Existing accounts use either summary data reported in other contexts, or data from very small samples of children. Thus, it is often difficult to know how common a reported pattern is. We need data from a large number of children in a variety of languages in the quantitative development of subjects and other syntactic elements.

6. Conclusion

Parameter-setting theory is attractive because it serves both as a theory of language and as a theory of acquisition. As a theory of language, parameter-setting regularizes and systematizes the variety of languages, thus gives an account for the fact that the languages of the world are limited in

number and kind of possible grammars, by specifying as parameter the major dimensions on which languages can vary. Each parameter typically takes one of two values. Any individual language is characterized by the set of values it takes across the spectrum of parameters. Further, some properties of languages which have been treated as totally unrelated are now seen to be entailed by a particular setting of a parameter.

As a theory of acquisition, parameter-setting provides a tidy account for the basic puzzle of language acquisition that children learn any language given in the environment, in a matter of a few years and without the need for formal lessons. The child begins the acquisition process with each parameter already set. The initial setting, plus the input the child will automatically receive, guarantees the correct outcome with a minimum of labor on the child's part.

In reality, however, languages do not fit as neatly into the categories as they should. There is more variation than the parameters allow.

In acquisition as well, as examined above, parameter-setting may not be the sole explanation for children's developmental stages. The type of linguistic explanation required for children's omissions of syntactically specified elements is not necessarily syntactic, but rather may be linked to phonological saliency, sentential complexity, and/or production limitations. Certainly, we can hardly deny that there are a lot of factors involved in children's early speech. Further research needs to be done on the interactions of various factors in children's early speech.

In order to evaluate pro-drop parameter hypothesis and possible alternative explanations for the characteristic phenomena of child language, it is helpful and necessary to study a large number of children in a variety of languages in the quantitative development of subjects and other syntactic elements.

To conclude, it seems to be true that linguistics has been somewhat out of step with psychology in that in has not taken sufficient account of maturation. It also seems to be true that psychology is notorious for its lack of theory. In

this respect at least, the parameter setting theory, even if it may turn out to be false, deserves to be seriously taken by those working on language acquisition.

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