

Is the Subset Principle Available to L1 Acquirers in the Course of Language Acquisition?

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Abstract

In the realm of language acquisition, different theories have been argued particularly when researchers try to find aspects of language acquisition or constraints on learnability as a cause of change. One of the proposed issues regarding learnability is the subset principle. It is more controversial when it is said that there is no negative evidence in the input and no overgeneralization occurs in language acquisition. This study investigates one important aspect of constraints on learnability, i.e., the subset principle. Attempts have been made to prove the role of subset principle in language acquisition by considering some issues such as negative evidence, overgeneralization and parameter setting and comparing and contrasting some examples concerning the subset principle.

Keywords: language acquisition, subset principle, negative evidence, overgeneralization

INTRODUCTION

The subset principle is a claim about how the diverse patterns of language are acquired. It is an important point when one does not take the maturational view of acquisition (Ingram, 1989).

Originally putting forward by Berwick (1985), Manzini & Wexler (1987), the subset principle (SP) states that: "the learner must guess the smallest possible language compatible with the input at each stage of the learning procedure" (Clark & Roberts 1993:304-5). In other words, it is one proposal posits that language learners choose options that allow the smallest number of grammatical sentences (Richards and Schmidt, 2002).

But the main point concerning SP is this moot question: can subset be a principle in language acquisition? In order to answer this challenging question it has been tried to

concentrate on the points such as parameter setting, lack of negative evidence and minor role of the input regarding processing and learnability.

NO NEGATIVE EVIDENCE

The conceptual interest of the SP lies in the widely recognized fact about language acquisition that children do not seem to make use of (direct) negative evidence. In other words, information that certain parts of the input text (sentences or strings), are ill-formed is not available, or at least not made use of by acquirers.

By referring to the poverty of the stimulus, no-negative-evidence-in-input can be understood as a conspicuous argument. In fact, when children make mistakes of grammar as they acquire language, they neither get corrected nor pay much attention to corrections. So, how do they recover from their mistakes?

On the basis of Berwick (1985) and what is cited in Hof and Shatz (2007), “no-negative-evidence” problem can be solved by the subset principle in which children are constrained to consider first only those grammars that generate a subset of grammatical sentences so that upon hearing the positive evidence of the broader set of sentences in input, they can adjust their grammars.

It can be concluded that if a grammar generates a language and that language is a superset of the target language that is posited, no positive-evidence can disconfirm this hypothesized system and the acquirer run the risk of falling into superset traps. Therefore, acquirers must always posit the grammar which generates the “smallest language” consistent with the trigger experience; in this way positive evidence can be maximized in the process of convergence towards the target grammar in the sense that evidence of this type may be sufficient to cause the acquirer to revise hypotheses (Biberauer and Roberts, 2007).

The role of input: A minor role

Regarding poverty of stimulus, the nativists argue that (1) the input to the child is an inadequate database from which to induce language structure, (2) children need relatively little exposure to the input to induce the structure of the language, and input has little to do with sequence or speed of acquisition, and (3) children must be attributed with innate linguistic knowledge for them to be able to construct language.

Chomsky’s (e.g., 1965, 1968, 1975) description of language as a system of marvelous complexity leads to nativist position. Chomsky’s assertion that a description of that system is a description of linguistic knowledge represented in the human mind, and the corollary assertion that studying the acquisition of language is thus to study how the language-specific system “flowers” from that knowledge. With this, he also claimed that children acquire language “on relatively slight exposure and without specific training” (Chomsky, 1975, p. 4). Furthermore, he argued, the input could not be very important because it is an inadequate database from which to induce language structure.

This “poverty of the stimulus” assertion has two component claims: (1) that the speech children hear is full of errors, and (2) that any set of sentences in a language is, in principle, inadequate as a database because the underlying structure of language is not fully revealed in surface structures of sentences. Chomsky also asserted that general-purpose learning mechanisms operating on input alone would be insufficient to construct the grammar of any language.

The above mentioned claims pave the way for the logical problem of language acquisition. In fact the logical problem of language acquisition has been termed by claiming that the acquired knowledge is complex, the available data are insufficient, and the learning mechanisms are inadequate together (Baker & McCarthy, 1981). The nativist solution to this problem has been to attribute innate linguistic knowledge of the universal properties of language to the child. That universal knowledge is then said to guide the child in constructing the language-particular instantiation of those universals from the input.

Regarding the logical problem of language acquisition, different proposals and viewpoints try to shed light on what is exactly innate and how children manage to learn the particulars of the language they hear. Among the proposals is the parameter setting model of acquisition (e.g., Hyams, 1986; Roeper & Williams, 1982), which attributes complex sets of parameters to the innate endowment of the child. Each parameter may give the child a choice of two or three “settings,” and the child’s job as an acquirer of the language is to determine from the input which setting fits the language s/he is hearing. (For example, the “pro-drop” parameter specifies that a language can have either obligatory overt subjects, like English, or optional overt subjects, like Spanish. Determining the correct parameter setting might be complicated because it may involve several correlated features of the grammar. (For example, whether or not a language allows pro-drop is correlated with whether that language allows expletive subjects (as in it is raining), or has “real” auxiliaries (may, can), without person, tense, and number marking). The theory explicitly holds that the innate parameters are designed in such a way that the child can set each parameter on the basis of very minimal information in the input, according to a “subset principle” (Berwick, 1985; Wexler & Manzini, 1987).

The following two examples can make the subset principle more tangible. The first example relates to null subject parameters and is taken from Manzini and Wexler, 1987. The second example is what is proposed by Pinker (1984, 1989a) about word order.

The null subject parameter serves to illustrate the role of subset relations in language development (Berwick, 1982, 1985; Manzini and Wexler, 1987). The “subset principle” which applies to all facets of language development, not just parameter setting can be summarized as follows: When there are grammatical options that produce languages that fall into subset-superset relations, the learner should always choose the grammar that generates the smaller language. For instance, if the only effect of the null subject parameter is the possible optionality of subjects, then the English setting would produce a proper subset of the Italian setting. Every sentence that one could produce with the English setting (e.g., “I go to the movies”) one could also produce with the Italian setting,

but there are sentences that one could produce with the Italian setting and not with the English setting (e.g., "go to the movies"). In other words, a language which allows only overt subjects is a subset of a language with both overt subjects and null subjects (Bloom, 1996, p. 29).

To take another example from Pinker (1984, 1989a), a language which has "fixed word order" (only Subject verb object, for instance) is a subset of a language with "free word order" (all orders of subject, verb, and object). The subset principle states that the initial hypothesis of the child should be that the target language has fixed word order, and this hypothesis should be abandoned only upon exposure to positive evidence. This is consistent with the data on children's acquisition of word order across different languages (Bloom, 1996, p. 29).

The idea behind the subset principle

Subset principle can be illustrated more in the following situations:

- If children follow the subset principle and select the smaller language and also this is the language spoken by adults, there is no need to any grammatical development.
- If children follow the subset principle and select the smaller language and also this is not the language spoken by adults, simple positive evidence will be enough to make grammatical change. Given that children start with an obligatory subject language and they are exposed to a single sentence with a missing subject, their exposure to this single sentence with missing subject could cause them to shift their parameter to the larger setting.
- If children violate the subset principle and start with a larger language, for example, the child's grammar allows both "I go to the movies" and "go to the movies" and the adult language allows only for the first type of sentence, what will happen to the child's grammar?

If negative evidence existed, then parental feedback could lead children to retract their overgeneralizations and move to the smaller grammar, but in the absence of such evidence, there is no obvious way for a child who has an overly large grammar to move to a smaller one. This motivates the subset principle.

PROBLEM OF SP

Although some researchers such as Berwick, Wexler and Manzini regard SP as a principle in language acquisition, it is helpful to state the problem of SP as well. One problem is the assertion of intersection relations instead of inclusion relations (Biberauer & Roberts, 2007).

Intersection relations rather than inclusion relations

Biberauer and Roberts (2007), state that many parameters and perhaps all ones that have been independently proposed in the literature on comparative syntax appear to define intersection relations rather than inclusion ones.

They try to shed light on this matter by giving some examples that one of them will be mentioned here. For example, by referring to the parameter which determines OV as opposed to VO order in transitive VPs, the following cases can be considered:

Setting to OV, the parameter generates the grammatical strings in (1a, b) and not the ungrammatical one in (1c), and setting to VO, it generates the strings in (2b,c) and not the ungrammatical one in (2a):

(1) a. John Sue loves. b. John walks. c. *John loves Su

(2) a. *John Sue loves. b. John walks. c. John loves Sue.

Clearly, the OV grammar and the VO grammar are in an intersection relation, as shown below (Biberauer and Roberts, 2007, p. 2);

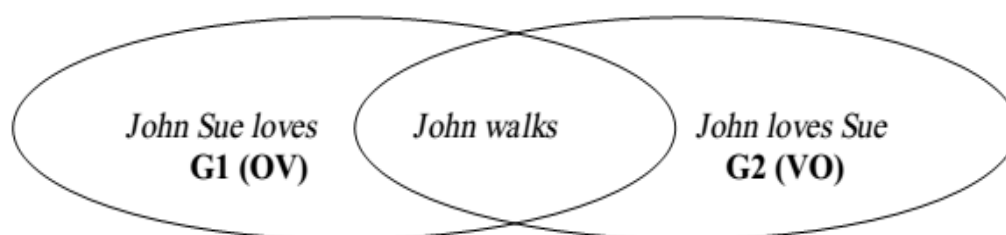


Figure1. Intersection relations (adopted from Biberauer and Roberts, 2007, p. 2)

Another example relates to the classical Null Subject Parameter proposed by Rizzi (1982) and Berwick (1985) took as an example to illustrate the SP, defines an intersection relation if one takes into consideration null-subject languages of the Italian type lack overt expletives while non-null-subject languages lack null pronouns:

(3) a. He speaks. b. *Speaks. c. It seems that John speaks.

(4) a. Lui parla. b. Parla. c. *Ciò sembra che Gianni parla

Again an intersection relation can be seen below (Biberauer and Roberts, 2007, p. 2):

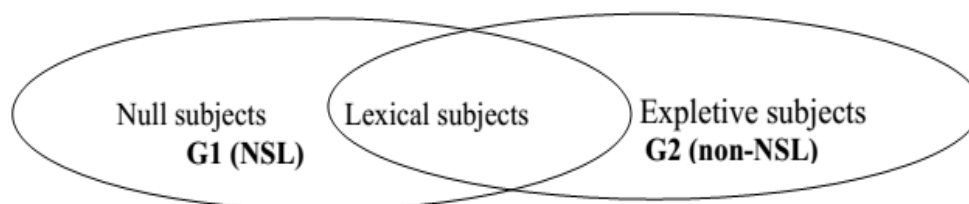


Figure2. Intersection relations (adopted from Biberauer and Roberts, 2007, p. 2)

For this reason, the SP has been thought to be of limited value. In fact, if all parameters turned out to define intersecting grammars the SP would be of no real value at all.

To explain further, let's refer to the case of the null subject parameter which was mentioned by Bloom (1996). On the basis of his idea, regarding the subset principle the child's initial hypothesis is that subjects are obligatory, as in English, and only through positive evidence will s/he move to the larger grammar where subjects are optional, as in Italian (e.g., P. Bloom, 1990a). However, under Hyman's analysis (1986), the two settings of the parameter do not fall into a subset relationship. Instead, "null subject" languages and "non-null subject" languages overlap, so that each has properties that the other lacks. Italian, for instance, has sentences such as "go to the movies" which do not appear in languages like English, while English has sentences such as "It is raining" (with expletive "it") that do not appear in languages such as Italian. Thus, with regard to the null subject parameter, English and Italian do not fall into a subset-superset relation; rather, they overlap, and the subset principle thus makes no prediction as to which should be the default setting.

DISCUSSION

Regarding parameter- setting models, it should be said that knowledge of language requires knowing what is impossible, although negative evidence is not directly available to children. Also some aspects of language and its acquisition appear to be stated outside the linguistic theory not inside it. So, supplementing the language faculty can be regarded as a solution to this problem. Also by pointing to aspects of language and acquisition outside the linguistic theory, a learning module can be put forward. An example of principle that appears in essence to be a principle of learnability is subset principle, which posits that language learners choose options that allow the smallest number of grammatical sentences, that is the least permissive.

On the basis of Lust (2006), Application of the SP to natural language acquisition assumed that:

- induction is the basic mode of acquisition
- the relation of the input data to the grammar in the mind of the learner is direct, simple and deterministic as it is in machine learning; and
- the relevant data are extensional, i.e., smaller sets of sentences included in larger sets of sentences. This proposal contrasts with intensional approaches which propose that the grammar in the mind provided by the Language Faculty (UG) restricts children's hypotheses (Lust, 2006, p. 61).

Working only with positive evidence would prevent overgeneralization by determining that children's first hypothesis would generalize only from a "subset" of the data, which would be "unmarked" and acquired first; a marked hypothesis would be adopted only on the basis of additional positive data – a superset. It means that that if the classes of languages to be learned were ordered in subsets and if learners begin by hypothesizing

that the correct language is the smallest one" then the learner will not overgeneralize and never changed their guess without positive evidence, then learnability could be achieved through inductive inference on the basis of positive evidence alone. For example, languages like Spanish which do not allow null subjects (i.e., -Pro Drop) allow a smaller set of sentences (those without null subjects) than languages which do (+Pro Drop), and thus may be viewed as forming a subset. In fact a separate "learnability module" with separate inductive learning principles, e.g., a subset principle, to supplement the Language Faculty and constrain the order of children's hypotheses has been postulated.

Consequently, regarding to what is said before, it can be concluded that:

- This is a principle designed to prevent the learner falling into error when more than one possible analysis is permitted under principles of grammar.
- The appeal of the subset principle in learnability terms is that it promotes error-free learning and so minimizes the need for negative evidence (evidence that a particular form is ungrammatical in the language to be learned).
- There is at least some empirical evidence that predictions of the subset principles are correct in terms of children's performance.
- The subset principle is an example of principle that appears in essence to be a principle of learnability- one which provides learner with an orderly procedure for positing hypothesis about the structure of the language.
- The principle will prevent errors and so help explain the fact that language is learned in a limited time span.

CONCLUSION

Most of the mentioned points consider the subset as a principle in language acquisition though some counter examples have been provided. They try to prove SP by taking into account the poverty of stimulus, lack of negative evidence and focusing on parameter setting. It can be said that these viewpoints relate more to nativism and those who rely on a separate learnability module.

But as it is clear, some researchers such as Bloom (1996) and Biberauer and Roberts (2007) consider the matter of intersection relations and overlapping rather than inclusion and subset relations. So, on the basis of the preceding mentioned points and by comparing and contrasting them concerning SP the following question can be put forward:

- How can children divide the languages into parts and sub-parts, parameters into marked and unmarked and is it possible to do these matters with all languages?
- Which point of view is correct and which one is not? Is it possible to look only at one of these points and ignore the other?

- If subset principle is true, how can the counterexamples be dealt with? Is it possible to prove subset not as a principle thoroughly? If this claim is true, what is the portion of SP in language acquisition?

These are the questions that can be investigated and studied in more details. The only thing that can be claimed is that, without any doubt, language acquisition is like an ocean, deep and vast and the studies done regarding it, is like a drop in the ocean. The more we move to know this ocean, the more we mesmerize by its wonders.

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