

THE LOGICAL PROBLEM OF LANGUAGE ACQUISITION:  
A REVIEW OF THE NEGATIVE EVIDENCE ISSUE

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Language is clearly a learnable skill. Nearly all children learn language without obvious effort or unusual incident. Current explanations of the child's language learning accomplishment have focused on positive evidence (via parental language input) as the basis from which children construct their language systems (Bowerman, 1987; MacWhinney, 1987, in press; Pinker, 1984, in press). In relying solely on positive evidence as input to language acquisition, learnability theories must address how children avoid constructing an overly general grammar; that is, in the absence of negative evidence or information about what is not a permissible sentence, how are children capable of recognizing and retreating from their language errors as they move toward adult language competence? This question has been termed the negative evidence paradox - Bowerman (1987) has suggested that this paradox "constitutes one of the most intriguing and difficult challenges" (p. 445) for scholars of child language acquisition.

Investigations and theories regarding the negative evidence paradox have considerable history. Braine (1971) may have been the first to address the issue in his questions about the validity of hypothesis testing/forming models of language learning; in order to learn language through hypothesis testing procedures, negative feedback about inaccurate language hypotheses would be essential. Braine (1971) did not believe that such negative feedback following language errors was present in input to children; his assertions were supported by the now classic Brown and Hanlon (1970) study indicating that mothers did not respond differentially with either explicit approval or disapproval following well-formed and ill-formed child utterances.

Following Braine's identification of the negative evidence paradox, Baker (1979) and his colleagues (Baker

& McCarthy, 1981) attempted to resolve the problem by suggesting that children are innately constrained to avoid any grammatical rules or constructions which, if inaccurate, could not later be corrected on the basis of positive evidence alone. Baker (1979) identified both benign errors and embarrassing errors in children's language. Benign errors are overgeneralizations such as failed, goed, and foots, for which there is an exact irregular counterpart exemplified in input language. Embarrassing errors, on the other hand, do not have exact irregular counterparts and cannot be shown to be in error through positive evidence alone. For example, the following pairs of sentences illustrate the partial regularity in dative constructions which could lead a child into the production of embarrassing errors.

#### 1. Dative Alternation

- a. John gave a dish to Sam.  
(prepositional dative)
- b. John gave Sam a dish.  
(double object dative)
- c. John donated a painting to the museum.  
(prepositional dative)
- d. \*John donated the museum a painting.  
(double object dative)

According to Baker (1979), children should not display embarrassing errors, errors which cannot be subsequently detected and expunged on the basis of positive evidence alone.

The flaw in Baker's (1979) hypothesis is the fact that the existence of embarrassing errors in children's language has been extensively documented. Child simply are not conservative in their use of language forms. For example, Bowerman (1983, 1987) cites numerous examples of embarrassing errors from the language of her children. Some examples of these embarrassing errors are as follows (from Bowerman, 1987).

#### 1. Dative Alternation

- a. I said her no. (3 years; 1 month)
- b. Don't say me that, or you'll make me cry.  
(2;6)
- c. I want Daddy choose me what to have. (2;6)
- d. Choose me the ones that I can have. (5+)

The existence of such embarrassing errors in children's language renders Baker's (1979) solution to the negative evidence paradox untenable.

Given this brief history of the negative evidence paradox, this paper will address a new solution to the problem, namely the learnability theory proposed by Steven Pinker (1984, in press). The paper will then review the claims of opponents of learnability theory, those who do not believe that the negative evidence paradox really exists. Finally, a few suggestions on how future studies of child language can contribute to clarifying the negative evidence paradox will be offered.

### **Pinker's Learnability Solution to the Negative Evidence Paradox**

Pinker (1984, in press) outlines procedures through which children are able to achieve adult language competence through exposure to positive language evidence, the finite sample of available environmental input. In addressing the negative evidence paradox, Pinker offers a solution quite different from Baker's (1979) 'constrain the child' position. For example, in examining dative constructions and the partial regularities which might lead children into embarrassing errors, Pinker (1984, in press) suggests that dative alternation constructions may be governed by certain subtle constraints, constraints which nonarbitrarily dictate which verbs can and cannot appear in double object dative constructions. If children are able to learn these constraints, they will be capable of avoiding overgeneralization errors. In the case of the dative, Pinker (in press) suggests two constraints, the first being phonological in nature and the second, semantic.

1. Dativizable verbs are "of native stock" (i.e., Germanic rather than Latinate). This means that dativizable verbs are monosyllabic or, if polysyllabic, stress is on the first syllable.

2. Dativizable verbs must be able to denote possession of the second object by the first object.

- a. Mom made the cake for Phil.
- b. Mom made Phil the cake.

- c. Mom stirred the cake for Phil.
- d. \*Mom stirred Phil the cake.

Pinker proposes similar phonological and semantic constraints for other constructions prone to embarrassing errors (e.g., lexical causatives and passives).

Pinker suggests that as children are able to identify and respect these constraints on dativizable/nondativizable verbs, they are able to avoid overly general dative errors. Finally, Pinker proposes a mechanism by which children can remove or retreat from existing from dative errors (and other language errors). The "Unique entry" principle purports that children will avoid having more than one entry in their language system competing for the same function; thus, if the child has failed to recognize dativizability constraints, and has produced an error form, this self-generated error will be removed when a competing form is provided in language input.

Pinker has supported his notion of phonological and semantic constraints on datives (and other constructions) by demonstrating that adults recognize and adhere to these constraints and that children are in the process of learning to do so. In a series of studies using carefully constructed nonsense words, Pinker and his colleagues (Gropen & Pinker, 1986) have demonstrated that adults and children are more likely to create double object datives for nonsense words obeying Pinker's (in press) dative constraints than for nonsense words not obeying the outlined constraints.

In reviewing Pinker's (1984, in press) solution to the negative evidence paradox, a few questions arise. First, as Boverman (1987) has pointed out, there appear to be "gaps" in the constraints offered by Pinker. In the case of datives, there are both positive exceptions (verbs that shouldn't dative, but do - radioed, xeroxed) and negative exceptions (verbs that should dative, but do not - choose) to the outlined constraints. These exceptions, particularly the negative exceptions, challenge Pinker's account. Pinker (in press) has recognized these exceptions and asserts that possibly he has not yet identified all relevant semantic and phonological features governing datives (and like constructions). Yet, these exceptions raise the question of whether the subtle, nonarbitrary constraints can ever be adequately defined, or if

continued exceptions will be identified.

A related question is, even if we are able to define the operating constraints, does Pinker's (1984, in press) theory actually describe what children do in identifying and retreating from their language errors? Certainly, Pinker's suggestions are empirically testable; according to Pinker's theory, children should first overgeneralize rules about language constructions (e.g., datives), then bring these productive overgeneralizations to a halt as they learn the relevant semantic and phonological constraints, and finally, expunge their existing overgeneralizations. It would also seem that the negative exceptions, if they are exceptions, to the constraints should appear in a great many errors in children's language and should persist over longer periods of times. As yet, these predictions have not been applied to child language data.

A final question about Pinker's model is the motivating force driving children to seek out, recognize, and ultimately apply particular constraints within their language systems. Although this is undoubtedly a very complex question, if we accept Pinker's constraints as accurate, we must address the forces that motivate the child to recognize and apply these constraints.

#### **Opposition to Learnability Theory: Is There a Negative Evidence Paradox?**

In 1970, Brown and Hanlon published a study of parental feedback to Adam, Eve, and Sara's utterances; Brown and Hanlon found that parents explicit disapproval or approval was in no way contingent on the syntactic accuracy of their children's utterances. In recent years, this classic study, originally designed as a response to behavioral theories of language development, has been used as support for learnability models, presuming that children receive little external guidance as to the accuracy of their utterances. In addition to being a potentially inappropriate application of Brown and Hanlon's (1970) findings, learnability models have overlooked a potential source of information to language-learning children - that is, implicit evidence regarding language structure via parental repetitions, clarification questions, expansions, and extensions.

In response to learnability models of language

acquisition, a number of researchers have suggested that implicit negative evidence does, in fact, exist in input to children (Bohannon, Stanowicz, & Ness, 1987; Demetras, Post, & Snow, 1986; Hirsh-Pasek, Golinkoff, Braid, & McNally, 1986; Hirsh-Pasek, Treiman, & Schneiderman, 1984; Penner, 1987). For example, Table 1 (following page) briefly reviews several studies which have demonstrated that parents respond differentially to their children's ill-formed and well-formed utterances. Repetitions, clarification questions, and expansions frequently follow ungrammatical utterances while topic extensions or other implicitly positive signals frequently follow grammatically accurate utterances. This feedback system is not without its noise however; Hirsh-Pasek et al. (1986) have documented that one mother provided implicit negative feedback following many ungrammatical utterances but also provided implicitly positive "move on" signals to many error utterances. Further, Demetras et al. (1986) attempted to judge the nature of errors prompting mothers' implicit negative feedback - whether the errors were semantic, pragmatic, phonological, or syntactic - and were unable to do so. If Demetras et al. (1986) were unable to determine the precise reason for the negative feedback, could the 2-year-olds receiving the feedback identify the nature of their errors from such feedback?

In reviewing these studies of implicit negative feedback to language learning children, there is some support for the claim that mothers respond differentially to their children's ill-formed and well-formed utterances. However, demonstrating the existence of implicit negative feedback is but a primitive first step toward the advancement of this line of reasoning. First, simply documenting the existence of implicit negative feedback reveals nothing about the salience or utility of such feedback; we do not know if children are sensitive to negative feedback and we do not know if feedback with so much noise could possibly be useful to children. Second, even if negative evidence were salient and useful, as yet, we have no data demonstrating that children actually use the implicit feedback provided by the parent to alter their language systems. Finally, even if negative evidence were salient, useful, and used, we would ultimately need to demonstrate that such feedback is necessary in input to language-learning children. Thus, although opponents of learnability theory have challenged the negative

TABLE 1

Selected Studies of Implicit Negative Feedback  
In Parental Speech

Study	#/Age of Subjects	General Findings
Penner (1987)	20 Parent-Child pairs: - 10 MLU 2-2.5 - 10 MLU 3-3.5	Differential response to ill-formed and well-formed utterances; ungrammatical utter. expanded, grammatical utter. extended; stronger trend for younger children
Hirsh-Pasek et al. (1986)	1 Mother-Child pair: - Child 2;3 - MLU 2.0	Mother responded with repetition or clarifi- cation questions following 53% of child errors; No negative feedback following 37% of child errors
Demetras et al. (1986)	4 Mother-Child pairs: - Children 2 years	Implicit responses (repetitions and clarification ques- tions) followed ill- formed utter. more frequently than well- formed utterances; authors were unable to determine what mother was implicitly respond- ing to (semantic, syntactic, pragmatic errors)
Hirsh-Pasek et al. (1984)	40 Mother-Child pairs - Children 2-5 years	Mothers exactly or partially repeated ill-formed utterances more frequently than well-formed utterances for 2-year-olds only, not for older children

evidence paradox, at this point, the data collected is not powerful enough to push back learnability claims of positive evidence alone as the basis for language acquisition.

A final relevant issue with respect to opposition to learnability theory is where researchers have looked for evidence of negative feedback. Generally, mothers' language to their 2-year-old children has been the focus of study. In contrast, according to learnability theory, the language structures for which negative evidence is needed (e.g., datives, lexical causatives, and passives) are all acquired at a late stage by children. Thus, individuals interested in demonstrating that negative evidence exists in language input to children have approached the negative evidence question at a different level than have learnability theorists. In essence, the two lines of research have asked different questions. Some intersection between these two lines of work would undoubtedly help clarify the negative evidence paradox.

### **Suggestions for Clarifying the Negative Evidence Paradox**

In reviewing the issues addressed in this paper, I recommend three directions for research. First, testing the fit of Pinker's model with children's overgeneralization errors is necessary. Questions of interest include charting the course of children's embarrassing errors over time with reference to Pinker's predictions. In addition, it would be informative to assess children's willingness to use dative constructions, including negative exceptions, at different ages and language levels.

A second area recommended for research is continued follow-up on the search for implicit negative evidence in parents' speech to their language-learning children. This area of research would be most enlightening if it were directed beyond the basic questions of existence of differential negative evidence, asking instead the more difficult questions of if and how children use implicit negative feedback in their task of constructing language rules. Ultimately, this line of research will want to address the necessity of implicit negative feedback to language learning children.

A final research suggestion involves attempting to find a balance between learnability theorists and

researchers studying parents use of implicit negative feedback. Finding complimentary areas for study would promote knowledge of the negative evidence paradox and children's language learning mechanisms. For example, if implicit negative feedback could be identified in language input to children learning constructions such as datives (also causatives and passives), learnability theorists would be likely to be interested in and influenced by such findings. Another potentially informative research idea would be to identify learnability issues that confront 2-year-olds (e.g., grammatical morpheme acquisition) and examine the implicit negative feedback children receive specifically related to such constructions.

Overall, then, these three areas of research have the potential to advance our understanding of the negative evidence paradox and children's language learning, in general.

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