Negative Evidence and Negative Feedback: Immediate Effects on the Grammaticality of Child Speech

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Abstract

Until recently, a long-standing assumption in the field of child language acquisition research was that parents do not correct the grammatical errors of their children. While consensus now exists that *potentially* corrective responses are

often supplied, controversy persists as to whether the child can identify and exploit such information in practice. To address these issues, this study adopts the contrast theory of negative input as a framework for analysis (Saxton 1995). In this theory, two distinct kinds of corrective input are identified, termed negative evidence and negative feedback, respectively. The corrective potential of each category was investigated by examining the immediate effects of each on the grammaticality of child speech. A longitudinal corpus of naturalistic data (49 hours) from a single child were analysed with respect to 11 grammatical categories. The effects of negative input were compared with two non-corrective sources of input, namely positive input and adult move-ons. It was found that grammatical forms were more frequent in child speech following negative evidence and negative feedback than either of the two non-corrective sources of input. In light of these, and related, findings, it is argued that corrective input may well prove important in explanations for how the child eventually retreats from error to attain a mature system of grammar.

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Introduction

There is a universal assumption within theories of child language acquisition that the grammar of young children is not perfect and that, consequently, grammatical errors are prone to arise in their speech. There is an equally strong assumption that normally developing children eventually recover from errors in the process of acquiring a mature, adult-like system of grammar. The task then is to explain how children achieve this recovery from error. Traditionally, this problem has been conceived as the 'no negative evidence' problem, on the assumption that children receive no help

concerning the bounds of grammaticality from the adult input (e.g., Jackendoff 1993; Pinker 1994). Alternatively, one might argue more generally that the child faces the *retreat problem,* this time on the assumption that it is essentially premature to rule out negative input as one of potentially several influences on the child's retreat from overgeneralization (Saxton 1997). In fact, a large number of studies have demonstrated that adults often respond to grammatical errors with utterances which look *prima facie* like corrections (Hirsh-Pasek, Treiman & Schneiderman 1984; Demetras, Post & Snow 1986; Penner 1987; Bohannon & Stanowicz 1988; Morgan & Travis 1989; Moerk 1991; Farrar 1992; Furrow, Baillie, McLaren & Moore 1993; Post 1994; Morgan, Bonamo & Travis 1995; Strapp 1999).

(1) a. Child: He shut me out and I telled ....
And I *telled* on him.
Adult: You *told* on him.

b. Child: Yeah, so they won't come *to apart.*
Adult: Well, they won't come *apart* if we put this on.

c. Child: Does the bike go *more quicker?*
Adult: No, the car's *quicker.*

d. Child: I can't sing *no* songs of yours.
Adult: *Any* songs.

Unless otherwise stated, the examples provided throughout are taken from a diary study described in Saxton (1995), where the child was aged 4;1-4;9. Italics are used simply to highlight particular linguistic forms, rather than to indicate stress. The corrective potential of the adult responses in these exchanges seems self-evident. Moreover, their occurrence in naturalistic adult-child discourse is undisputed, being

reported in all of the studies cited above. However, the consistent replication of this discovery has done little to help resolve the long-standing controversy about whether or not children's grammatical errors are subject to negative input.

Potentially corrective responses are often described as a form of recast, in which the adult "expands, deletes, permutes, or otherwise changes the [child utterance] while maintaining significant overlap in meaning" (Bohannon, Padgett, Nelson & Mark 1996: 551). However, numerous conceptual difficulties have been raised with the notion of recast-as-correction (e.g., Bowerman 1988; Pinker 1989; Marcus 1993). In consequence, the corrective potential of responses like those in (1) is obscured when they are discussed in terms of recasts (for a detailed review, see Saxton 1997). An alternative approach lies in the contrast theory of negative input (Saxton 1995; 1997). Within this theory, the term *negative input* is used as an umbrella term to describe any error-contingent response which bears a corrective potential for the child. On a point of terminology, the term *negative evidence* is often used interchangeably with a range of alternatives, including *negative feedback, negative data* and *negative information,* with few, if any, discernible differences in meaning between them. However, within the contrast theory, the terms *negative evidence* and *negative feedback* are carefully distinguished, in order to denote two different kinds of corrective input.

> *Negative evidence*
>
> Negative evidence occurs directly contingent on a child grammatical error, and is characterised by an immediate contrast between the child error and a correct alternative to the error, as supplied by the child's interlocutor.

(2) a. Child: He was the *baddest* one.
Adult: Yeah, he sounds like the *worst*.

b. Child: But I won't have *many* left.

[referring to a pot of chocolate mousse]

Adult: You don't have *much* left.

Negative feedback

Negative feedback occurs directly contingent on a child grammatical error, and provides a non-specific indication that something is amiss within the preceding child utterance. Negative feedback occurs most typically in the form of an error-contingent clarification request.

(3) a. Child: Why is our car *the only?*

Adult: The what?

b. Child: I just *blowed* on your dinner for a little bit.

Adult: On my dinner?

The category definitions above are exclusively concerned with the status of adult responses as a potential form of corrective input. Definitions of recast, on the other hand, typically encompass adult responses which are not even contingent on child grammatical errors (see Saxton 1997, for discussion of Nelson's rare event theory and the broader role of recasts in child language acquisition). The hypotheses described below predict how each form of negative input might assist the child in solving the retreat problem. Thus, the direct contrast hypothesis is concerned with the functioning of negative evidence, while the prompt hypothesis predicts how negative feedback might fulfil a corrective function for the child.

The direct contrast hypothesis

The direct contrast hypothesis recognises the fact that a unique discourse context is engendered when a child error is directly juxtaposed with the correct adult alternative. Specifically, it is predicted that this discourse pattern may bear a corrective potential for the child.

> *The direct contrast hypothesis*
>
> When the child produces an utterance containing an erroneous form, which is responded to immediately with an utterance containing the correct adult alternative to the erroneous form, (i.e. when negative evidence is supplied), then the child may perceive the adult form as being in *contrast* with the equivalent child form. Cognisance of this contrast can alert the child to the differing grammatical status of child and adult forms.

(4) Child: I say it *gooder.*
Adult: *Better.*
Child: *Better*, yeah.

During the exchange in (4), both child and adult are focused on the same topic of conversation at the same time. In consequence, the adult's repudiation of the child form, *gooder*, is likely to be especially conspicuous to the child. This repudiation is achieved through the expedient of producing an alternative to the child form. Critically, the contrast between the two forms, *gooder* and *better,* is rendered especially salient by their immediate juxtaposition in the discourse. If *gooder* were a perfectly acceptable form, there would be no reason for the adult to go the trouble of

selecting an alternative form. Interestingly, the likelihood of a speaker producing a given grammatical structure is significantly increased if it has already occurred in the immediately preceding speech of an interlocutor (Levelt & Kelter 1982; Bock 1986; 1989). It is conceivable, therefore, that in (4), there may be an expectation in the child that the adult will also select *gooder* in this context of utterance. The violation of this expectation might then contribute to the child's apprehension of the contrast in usage between child and adult forms.

According to the direct contrast hypothesis, the fact that the adult displays an immediate preference for a different form should underscore the *contrast in usage* between the two forms, *gooder* and *better*. Certainly, it is this contrast in usage which the child must attune to in order to solve the retreat problem. Thus, the child must become apprised of the fact that, although *gooder* and *better* fulfil precisely the same function grammatically, the adult displays a clear preference for *better*. In summary, the direct contrast hypothesis predicts a dual function for the adult utterance: the selection of one particular form by the adult is held to affirm its acceptability, while its juxtaposition with the child's own, different selection is held to signal the rejection by the adult of that child form. Whichever way the child solves the retreat problem, it is clear that both these elements of knowledge are required in order to attain a mature system of grammar. It is not enough for the child simply to know that, for instance, irregular forms like *better* are grammatical. She or he must also become apprised of the fact that *gooder* is ungrammatical.

The direct contrast hypothesis predicts that the discourse context in which linguistic forms occur can affect the quality of information conveyed to the child about grammar. The corrective potential of negative evidence, as defined here, is held to derive from the unique discourse structure which obtains. Thus, the direct contrast apparent in cases of negative evidence, where the (erroneous) child form and the (correct) adult alternative are immediately juxtaposed, is not evident in any other discourse context. Instead, other instances of the grammatical form in adult speech occur in one of two contexts, neither of which can be easily construed as supplying

corrective information to the child. Thus, the correct adult form may occur quite independent of the child's erroneous productions. Alternatively, though more rarely (Bohannon & Stanowicz 1988), the correct adult form may occur directly following a correct usage of that form by the child. In neither case is there any element of contrast between child and adult forms. Consequently, the only information which could be conveyed to the child in these cases is the grammaticality of the adult form.

The prompt hypothesis

It will be recalled that negative feedback was defined as a non-specific signal that something is amiss with the child's previous utterance. Potentially, there are a number of ways in which the adult might provide a general signal of this kind. For example, an unexpected pause in the conversation might be interpreted in this way (i.e. a 'meaningful silence'). In this respect, Penner (1987) reports that parental pauses in excess of 2 seconds are closely associated with child grammatical errors. One might also mention the possible use of facial expressions. Thus, raised eyebrows and a longer than normal gaze (a typical expression of surprise) might also cause the child to pay attention to the form of a previous utterance. Finally, particular patterns of stress and intonation might pressure the child into returning to her original utterance. Older children in particular might respond to a sardonic tone in this way. All of these possibilities may be employed by adults on occasion, but perhaps the most reliable source of negative feedback is to be found in error-contingent clarification requests.

The category of clarification requests is generally considered to encompass any request for clarification or confirmation in which the adult signals that the previous child utterance was misapprehended or inappropriate in some way. Evidently, there are several possible reasons why an adult might seek some form of clarification from the child: the meaning of the child utterance may not be clear; the phonological or structural form may not be acceptable; the parent may simply have

misheard what the child said; or the child utterance may be perfectly acceptable linguistically, but the content may be somewhat surprising or unexpected. This multiplicity of functions is regarded as problematic by Morgan & Travis (1989:548), who suggest that 'the more functions a given response type takes on, the more difficult it will be for the child to discern those occasions on which the response is intended to fulfil its syntax-correcting function.' On this view, the child is characterised as some sort of amateur sleuth, sifting through the many possible intentions of the adult, in order to identify their current locus of concern. This task would indeed be highly demanding, but it is important to recognise that, whatever the motives of the parent in producing clarification requests, it is the way they are interpreted by the child which is of importance. Thus, the child may elect to focus on a certain aspect of the original utterance, at a given linguistic level, according to her own predilections. And while it may be a mystery at present as to what factors train the child's attention onto one aspect of communication over another on a particular occasion, it remains the case that children respond to clarification requests without any discernible hesitation or difficulty (Gallagher 1977). With regard to their potential role as a form of negative input, there is a distinct possibility that, on some occasions, an error-contingent clarification request might draw the child's attention to the occurrence of a grammatical error in their previous utterance. If this proved to be the case, the child's response would in no way depend on an ability to divine the adult's intentions in producing clarification requests.

Most investigations of clarification requests have not been directly concerned with negative input, but the general findings are fully consistent with the corrective function projected for them. First, it has often been reported that children as young as two-years-old display a remarkable willingness to respond appropriately to clarification requests. That is, children do not generally ignore these discourse signals, but have a strong tendency to repeat or otherwise reformulate their original utterance in some way. Estimates of the proportion of inappropriate child responses are uniformly low, ranging from fewer than 1% (Gallagher 1977) up to 15%

(Anselmi, Tomasello & Acunzo 1986). A second finding of importance is that children do not automatically repeat their initial utterance verbatim, but very often institute revisions of various kinds (Gallagher 1977; Tomasello, Farrar & Dines 1984; Brinton, Fujiki, Loeb & Winkler 1986; Tomasello, Conti-Ramsden & Ewert 1990).

These findings suggest the possibility that (error-contingent) clarification requests might sometimes act as a form of negative feedback. Thus, in response to corrective input, one might expect the child to take stock of the relevant utterance, and one might also predict that the child would revise it in some way. The corrective potential of clarification requests has been touched on in a number of previous studies. Thus, Demetras et al. (1986) reported that clarification requests follow ungrammatical child utterances more often than their grammatical counterparts, a finding echoed by both Penner (1987) and Bohannon & Stanowicz (1988), (although see the data on Sarah reported by Morgan & Travis 1989). In fact, it has become clear that studies based on patterns of differential responding provoke numerous conceptual difficulties (see Saxton 1997, for detailed discussion). Nevertheless, previous empirical studies are valuable for confirming that negative feedback, as defined here, is provided to children. Moreover, the following exchanges suggest that negative feedback can sometimes train the child's attention specifically on aspects of faulty grammar.

(5) a. Child: Knights have *horse,* they do.
Adult: They what?
Child: Knights have *horses,* I said.

b. Child: A pirate *hitted* him on the head.
Adult: What?
Child: That pirate *hit* him on the head.

c. Child: Why did they *caught* him when they ran away?

Adult: Why did they what?

Child: Why did they *catch* him?

The child responses in (5) strengthen the claim that a genuinely corrective function is being fulfilled, if only in the short-term. The prompt hypothesis, set out below, predicts how negative feedback might be utilised by the child in solving the retreat problem.

The prompt hypothesis

Negative feedback can prompt the child to attend to an ungrammatical form in a previous utterance, and apprehend it as such, in just those cases where the child has prior knowledge of its ungrammaticality.

Thus, it is predicted that negative feedback can prompt recall of grammatical forms in cases where errors persist. Certainly, negative feedback, by itself, can do no more than alert the child to the occurrence of a linguistic form which is already known to the child as an error from past experience. For error-contingent clarification requests, in and of themselves, do not convey information on how to rectify grammatical errors (e.g., a model alternative to an erroneous form, as with negative evidence).

Evidently, negative feedback is only required in cases where the child's memory retrieval system has failed. There is an assumption, therefore, that the child's memory is immature in this respect, an assumption which is shared by Marcus and colleagues in their work on morphological development (e.g., Marcus 1995). It is important to note that relatively little is yet known about the development and capacity of very young children's memory retrieval systems. What is well established, though, is that retrieval is greatly improved when cues are provided (e.g., Smith, Cowie, and Blades 1998). Negative feedback can therefore be viewed as a special form of cue for helping in the retrieval of linguistic forms from memory.

Testing the Effects of Negative Input

With respect to the immediate effects of negative input, it has emerged that children do sometimes drop an erroneous form in favour of the correct alternative modelled by the adult, as the examples in (6) below illustrate.

(6) a. Child: I'm going to Colin's and I need some toys.
Adult: You don't need a lot of toys.
Child: Only *a little bit* toys.
Adult: You only need a few.
Child: Yes, *a few* toys.

b. Child: He wiped *him.*
[reflexive action of a 3rd person]
Adult: He wiped himself.
Child: Yes, he wiped *himself.*

c. Child: Michael dad gave them to him.
Adult: Who?
Child: *Michael dad.*
Adult: Who?
Child: *Michael's dad.*

d. Child: I'm losing myself.
I losed my hands.
I *losed* my hands.
[pronunciation: / lu:zd /]

[action: pulling hands up inside pyjama sleeves]

Adult: You lost your hands?

Child: I *lost* my hands.

Yeah, here they are.

For convenience, these shifts in child speech from erroneous to correct forms (in consecutive utterances) will be referred to as E→C shifts. For seven categories of morphological child error, Farrar (1992) reports that so-called corrective recasts elicited E→C shifts on 12.0% of occasions. Morgan et al. (1995), meanwhile, provide very little descriptive data on levels of E→C shifts, although for one category of error (articles) so-called target recasts evoked E→C shifts on 23% and 29% of occasions for Adam and Eve, respectively (Brown 1973; MacWhinney & Snow 1990). Considered only from the point where the child uses articles correctly on 50% of occasions, the level of E→C shifts reported for one of these children (Adam) increased to 58%.

Farrar (1992:95) reports that E→C shifts are significantly more frequent following corrective recasts than positive input and concludes that 'negative evidence provided by corrective recasts is a very salient type of response to children's sentences.' In contrast, Morgan et al. (1995:186) report no significant differences in levels of E→C shifts when recasts are compared against adult move-ons, leading them to assert that there is 'no evidence to support the contention that recasts provide negative evidence and serve as corrections.' One is left, then, with strikingly different conclusions from the two extant studies in this area. One possible reason for the discrepant findings is that different bases of comparison are used in each study. While Morgan et al. (1995) compared the effects of recasts with move-ons, Farrar identified three categories of positive input. The two studies also differ with respect to the definitions of recast in force. Of particular note is the fact that Morgan et al.'s definitions of recasts exclude potentially many corrective responses from analysis (Saxton & Kulcsar 1995; Bohannon et al. 1996). For example, Morgan et al.'s

category of *expanded recast* for articles refers only to cases where the adult correction repeats precisely the same noun as that featuring in the child's error. In consequence, all cases where the adult selects a different noun would not count as an expanded recast. Thus, in the constructed examples below, Morgan et al. (1995) would count the adult response in (7) as (potentially) corrective since it conforms to their definition of an expanded recast, whilst adult responses like that in (8) would be excluded.

(7) Child: He likes cat.
Adult: Yes, he likes *the* cat.

(8) Child: He likes cat.
Adult: Yes, and he likes *the* dog, too.

Undoubtedly, there is a clear distinction to be made between the cases exemplified in (7) and (8), a distinction which may or may not prove critical in the study of negative input. In (7), one is presented with a highly limited view of what it means to be corrected, for there is an implicit assumption that the child will be able to detect corrections of grammatical errors only when the lexical content is held constant from child utterance to adult response. Morgan et al. (1995) provide no justification for this assumption, nor do they cite any evidence to suggest that young children are fazed by superficial lexical differences, as in (8). In principle, then, it is entirely plausible that the child might interpret the adult response in (8) as corrective, yet this possibility is not explored by Morgan et al. (1995). Something in the region of 25% of adult move-ons identified by Morgan et al. (1995) contained an article in response to a child article error (James Morgan, personal communication), a fact which could have a significant influence on the outcome of empirical enquiry. Accordingly, a central empirical aim of the present paper is to test the effects of negative evidence against a category of error-contingent responses which is much less easily construed as a source of corrective information. In this way, it is far less likely that one will end

up comparing like with like. More generally, the study described below aims to examine the immediate effects of negative evidence and negative feedback on the grammaticality of child speech. That is, does corrective input, as defined within the contrast theory, encourage the child to shed erroneous forms in favour of the grammatical adult alternative? A reasonable prediction is that negative input should naturally encourage higher levels of E→C shifts than non-corrective sources of adult input. Accordingly, this study unites both bases of comparison considered in previous studies, namely, positive input and so-called adult move-ons.

Method

Data

The data analysed here are drawn, via the Child Language Data Exchange System, from the Brown (1973) corpus (see also MacWhinney & Snow 1990). In particular, the data gathered on Eve were selected for analysis, since it is widely acknowledged that they provide a particularly rich record of language acquisition (e.g., MacWhinney 1995). Eve was recorded over a nine month period, between the ages of 1;6 and 2;3, during which she displayed a precocious rate of language development on a number of indices. For example, her MLU increased from 1.50 to 4.25 (Brown 1973:57), a rate of increase which far outstripped that witnessed in Brown's other two subjects, Adam and Sarah. The transcripts from Eve's data are organised into 20 separate, numbered samples, and comprise a total of 49 hours of conversational data.

Procedure

Categories of grammatical error

Eleven categories of grammatical error were identified. Specifically, there were nine morphosyntactic categories: present progressive; prepositions; plural; irregular past tense; auxiliaries; possessive; Noun Phrase specifier; 3rd person singular; and copula. An innovation in the present study is that the data were additionally coded for two purely syntactic categories: grammatical subject and grammatical object (see Table 1 for examples of each category). Thus, a wider range of structures was examined than in previous research (c.f. the seven morphosyntactic categories identified by Farrar 1992, and the two morphosyntactic categories studied by Morgan et al. 1995).

TABLE (1) ABOUT HERE

Categories of child utterance

Following Farrar (1992) and Morgan et al. (1995), analysis was confined to just those child errors which are immediately followed by an adult utterance. Hence, the focus is exclusively on what happens when adults actually take the opportunity to respond to ungrammatical child utterances. Thus, in cases where the child produces a sequence of utterances, it will only be the final one that could qualify for error coding, and then only when followed by an adult utterance. Similarly, only the first adult utterance which follows a qualifying child utterance was coded for adult responses. Child utterances coded as wholly or partially unintelligible were excluded from the error coding procedure. An inspection of Table (1) reveals that a given child utterance often exemplifies more than one category of error. For qualifying child utterances, all instances of child errors were coded, for the 11 categories under consideration, regardless of the occurrence of other errors in an utterance. In coding, it was sometimes necessary to infer Eve's conversational intentions from the surrounding discourse and topic of conversation. Many of the categories exemplified in Table 1 are based on those described by Farrar (1992). However, some of them may not be

entirely self-explanatory. The NP specifier category, for example, replaces the standard category of articles, in a desire to err on the side of caution. For the missing element from a child NP is not always easy to identify unequivocally as an article. Thus, NP specifier errors were taken to cover the following range of grammatical phenomena: determiners (definite and indefinite articles); demonstrative adjectives; numerals; and quantifiers. Of note also is the category of present progressive, which here focuses specifically on those utterances where the child omits the *be* auxiliary (e.g., *Eve crying).* This decision reflects the fact that other kinds of errors with the present progressive, including omission of the *-ing* suffix from the main verb, were surpassingly rare, an observation in accordance with Brown's (1973) finding that this morpheme is one of the earliest acquired. Instances of subject omission and object omission, meanwhile, were identified according to the criteria set out by Hyams & Wexler (1993:246).

Adult response categories

Adult utterances were coded for five categories of input: negative evidence; negative feedback; adult move-ons; positive input; and non-error-contingent clarification requests. Of these, negative evidence, negative feedback, and adult move-ons occur directly contingent on child grammatical errors, while positive input and non-error-contingent clarification requests occur in other contexts (see below). The category of adult move-ons (AMO) essentially parallels the category of move-ons described by Morgan et al. (1995) in its intention to capture instances where the adult responds with non-corrective input to child grammatical errors. However, an adult move-on was defined here as an adult utterance, directly contingent on a child grammatical error, which did not qualify as either negative evidence or negative feedback. In consequence, it will be clear from the preceding discussion that the class of utterances

actually encompassed by the move-on category differs significantly from that described in Morgan et al. (1995).

Adult utterances were also coded for positive input with respect to the eleven target structures. Positive input for a particular structure was supplied in an adult utterance which modelled that structure, excluding all cases of negative evidence. Of course, negative evidence also entails the modelling by the adult of a correct form. On these definitions, therefore, negative evidence and positive input are identical with respect to the *linguistic* information modelled by the adult. The critical difference between the two lies only in the discourse context within which that information is presented to the child. Only negative evidence is contingent on child errors. Given these category definitions, it is possible to test the direct contrast hypothesis, since this hypothesis is predicated on the assumption that it is the immediate juxtaposition of differing child and adult forms which underlies the corrective impact of negative evidence. On this view, the presence of the adult form in alternative, non-error-contingent contexts (positive input) should not result in a corrective pressure on the child. The data were also coded for the presence of non-error-contingent clarification requests with respect to the 11 target structures. The aim was to provide a basis for comparison with negative feedback (that is, error-contingent clarification requests). Adult utterances sometimes exemplified multiple instances of a particular kind of input with respect to one of the target structures. In such cases, every instance of adult input was coded for and a corresponding child response was also coded.

Child response categories

Child responses to relevant adult input fell into one of three categories: Use Correct (UC); Persist-with-Error (PE); and Child Move-On (CMO). In all cases, the first utterance produced by the child following one of the four adult input categories was taken as the relevant utterance for coding. In Use Correct (UC) responses, the child

utterance correctly exemplifies one of the eleven aspects of grammar under scrutiny. It is important to note that a child response does not have to be grammatical in its entirety in order for UC to be coded. Instead, the child simply needs to use a particular target structure correctly. Persist-with-Error (PE) responses were coded when the child produced an erroneous form, regardless of the preceding adult input. This category is intended to capture the intuition that, although corrective input may not always induce the child to produce a Use Correct response, it may nevertheless depress any tendency in the child to persist with an erroneous form, at least in their subsequent utterance. Specifically, it was predicted that PE responses should be less frequent following corrective input than following either adult move-ons or positive input. Finally, child responses which could be classified as neither Use Correct nor Persist-with-Error were coded in the final category of Child Move-On (CMO) responses. Essentially, CMO responses comprised those utterances where the child did not use the relevant structure in any form. Child Move-Ons were also scored in all cases where the child response contained unintelligible material. In all, fifteen separate discourse patterns were identified, as represented schematically in Figure (1) below.

FIGURE ONE ABOUT HERE

Results

Across all eleven categories of grammatical structure, a total of 4,406 errors were identified in Eve's corpus, while positive input was supplied in 9,630 instances. Of the grammatical errors, 2,006 were subject to negative evidence (45.5%), while 1,054 were subject to negative feedback (23.9%). Overall, 2,473 of Eve's errors (56.1%) were responded to with some form of negative input (either negative evidence only, negative feedback only, or both negative evidence and negative feedback combined;

see below). When compared with recent recast-based research, it becomes apparent that a considerable degree of variability exists in the levels of corrective input reported. Thus, Bohannon & Stanowicz (1988) report a figure of 34% for all kinds of grammatical error, while Farrar (1992) reports a figure of 22% across seven morphosyntactic categories. From Figures 1 and 6 in Morgan, Bonamo & Travis (1995), meanwhile, it is apparent that, for Adam, Eve and Sarah, article errors are recast at a rate of roughly 49% while WH-question errors are recast on about 11% of occasions (26% for Eve).

Use Correct Responses

In the first instance, child responses to negative evidence, negative feedback, adult move-ons and positive input were allocated to one of the three categories described above: Use Correct (UC); Persist-with-Error (PE); and Child Move-On (CMO). Table 2 below details levels of UC, PE and CMO responses produced for each kind of adult input. It is apparent from Table 2 that, overall, levels of Use Correct responses are very similar for negative evidence (7.8%), negative feedback (6.6%) and positive input (6.5%). UC responses to adult move-ons, meanwhile, are considerably less frequent (2.9%).

TABLE (2) ABOUT HERE

In the first set of analyses, data from across the nine-month sampling period were conflated for each structure, a practice which inevitably ignores changes in child responsiveness over time. A repeated measures one-way ANOVA (four levels: negative evidence, negative feedback, positive input and adult move-ons) revealed a significant main effect for Use Correct responses ($F_{1,10} = 13.72$, $p < .004$). Planned comparisons further confirmed that UC responses were more common following negative evidence than adult move-ons ($t = 3.64$, $df = 10$; $p < .003$). However, the

equivalent comparison with negative feedback did not reach significance. Nor were any significant differences found when positive input was compared with either negative evidence or negative feedback.

These initial analyses do not suggest that negative input enjoys any special advantage over positive input in its ability to elicit grammatical forms from the child. However, it is possible that important differences are being obscured by the practice of conflating data across the entire nine-month sampling period, since data may be included from periods when the child is not actively engaged in acquisition of the relevant structures (Morgan et al. 1995). It was decided, therefore, to replicate Morgan et al.'s procedure whereby data for each structure were included only from the point that the child had attained 50% grammatical accuracy. The figure of 50% represents a point in development when one might expect the child to be especially in need of corrective input. For it is at this point that the child vacillates equally between grammatical and ungrammatical forms. For each structure, therefore, the data were coded for all grammatical usages by Eve, in order to compute the percentage level of accuracy in each sample. By plotting changes in grammaticality over time, it was possible to estimate the point in development when Eve attained 50% grammaticality for each of the target structures. For one of the structures, the present progressive auxiliary, this level was not reached during the sampling period. For the remaining structures 50% accuracy was attained at the following ages: prepositions (1;9); plural (1;10); irregular past tense (1;10); auxiliaries (2;2); possessive (2;1); Noun Phrase specifier (1;10); 3rd person singular (2;1); be copula (2;3); subject (1;7); and object (1;6).

TABLE (3) ABOUT HERE

The presence of some zero scores means that the data may not have been normally distributed, so a non-parametric Friedman Analysis of Variance was conducted, with repeated measures across the four input conditions described above. This test

revealed a significant main effect for Use Correct responses ($\chi^2 = 13.4$, df = 2; $p < .0012$). It is immediately apparent from Table (3) that child responsiveness increases for all types of adult input, when this more restricted sample is considered. This effect is probably due, in part, to the simple fact that the child's speech is more grammatical in this sample, and hence the occurrence of correct forms, in whatever context, is likely to increase. Nevertheless, it is also very striking that the increases observed with respect to the non-corrective sources of input are markedly less dramatic than the increases for both forms of negative input. Overall, Use Correct responses occur on 7.1% of occasions following adult move-ons and 9.5% following positive input, as against 20.5% for negative evidence and 17.4% for negative feedback. Individual comparisons confirmed that the differences between input conditions were significant. Thus, negative evidence was associated with higher levels of UC responses than both adult move-ons (Wilcoxon $Z = 2.52$, $p < .006$) and positive input (Wilcoxon $Z = 1.84$, $p < .033$). And negative feedback also elicited higher levels of UC responses than adult move-ons (Wilcoxon $Z = 1.82$, $p < .034$) and positive input (Wilcoxon $Z = 2.07$, $p < .019$). There was no significant difference between positive input and adult move-ons (Wilcoxon $Z = 0.89$, $p < .374$). In summary, these analyses allow one to gauge the child's responsiveness at a point in development when corrective input would be of particular value for the child. And the findings reveal that it is precisely at this point when the child is especially likely to pick up on the corrective information supplied by both negative evidence and negative feedback. It is also at this later stage of development when the contrast between corrective input and the two forms of non-corrective input is most clearly apparent.

Persist-with-Error responses

It will be recalled that Persist-with-Error (PE) responses were projected as a more subtle indicator of the effects of corrective input. It was reasoned that, although the

child may not overtly produce the correct adult model, she or he may nevertheless be less likely to persist in repeating an erroneous form. Thus, corrective input might suppress the occurrence of erroneous forms, in addition to its function in promoting the use of correct forms. However, analyses which adopted individual structures as the within-subjects factor revealed no significant main effect for PE responses (χ^2 = 5.00, df = 4; ns). Nor did any of the individual comparisons between corrective and non-corrective sources of input reveal any significant differences. It would seem, therefore, that levels of PE responses do not function as an index of effectiveness in the same way that Use Correct responses clearly do.

Effects of clarification requests

In order to address the predictions made above concerning negative feedback, those adult clarification requests which did not follow child grammatical errors were also coded, provided they exemplified one or more of the eleven target structures. In this way, a basis for comparison is arrived at with respect to the effects of error-contingent clarification requests (negative feedback) versus non-error-contingent clarification requests. As mentioned above, adult clarification requests are well-known for prompting one of two response types, namely, verbatim repetition, or some sort of modification to the original utterance. Of particular interest here, of course, are modifications to the *grammaticality* of child forms. As reported above, error-contingent clarification requests (negative feedback) sometimes evoke a switch from erroneous to correct forms (E→C shift). However, it is possible that this switch is symptomatic of no more than a generalised impulse to switch from one version of a linguistic form to another. Thus, in the case of a *non*-error-contingent clarification request, the child might be tempted to switch from correct to erroneous (C→E shift). The examples in (9) and (10) are constructed for expository purposes.

Error-contingent clarification request (negative feedback)

(9) Child: The dog just bited me.
Adult: What?
Child: The dog just bit me.

Shift: Erroneous → Correct

Non-error-contingent clarification request

(10) Child: The dog just bit me.
Adult: What?
Child: The dog just bited me.

Shift: Correct → Erroneous

If it emerged that C→E shifts were just as prevalent as E→C shifts, then it would be difficult to conclude that error-contingent clarification requests (negative feedback) were exerting a corrective influence. In order to demonstrate that error-contingent clarification requests can be construed as a form of negative feedback, therefore, one must demonstrate that the grammatical modifications induced by clarification requests are (largely) confined to the change from erroneous to correct. Accordingly, non-error-contingent clarification requests exemplifying one or more of the eleven target structures were identified and coded for subsequent child responses. Of interest were instances where the child produced a C→E shift, coded as Change-to-Error (CE). In addition, the data were also coded for occasions on which the child persisted with a correct form (a C→C shift), coded as Persist-with-Correct (PC). It was predicted that

C→C patterns would be more common than the analogous E→E patterns which might arise for error-contingent clarification requests (negative feedback).

In principle, it would be possible to perform the analogous set of analyses for negative evidence. Thus, one would examine levels of C→E shifts in cases where a correct child form is followed directly by a correct adult model. In practice, however, adult repetitions of correct child forms are very rare. For example, Bohannon & Stanowicz (1988) report that E→C shifts are eight times more frequent than the equivalent C→E shifts.

A one-way, repeated measures Analysis of Variance revealed a significant main effect for modifications in Eve's speech ($F_{1,9} = 27.17$, $p < .0005$). Eve was far more likely to shift from erroneous to correct than vice versa ($t = 4.23$, $df = 19$; $p < .0005$). One potential problem is that the categories of negative evidence and negative feedback overlap to some extent. As the examples in (2) and (3) above reveal, it is possible for adult responses to manifest each form of negative input independently. However, it is also important to recognise that negative evidence and negative feedback can co-occur within a single adult response, as illustrated by the following exchanges:

(11) a. Child: I don't even know *what is* a patient.
Adult: You don't know *what* a patient *is?*

b. Child: I'm *easy to eat* you up.
Adult: You can *eat* me up *easily?*

Given the occurrence of this partial overlap, one might want to argue that the child's propensity to switch to the correct form is dictated largely by the adult's modelling of the correct form in some cases (negative evidence), rather than the pressure exerted by the clarification request (negative feedback). A further comparison was computed, therefore, in which instances of negative evidence were left out of analyses, leaving

only 'pure' forms of negative-feedback-only. In this way, one can isolate the effects of clarification requests only on the child's responses. It emerged that E→C shifts were still far more prevalent than C→E shifts in Eve's speech ($t = 3.03$, $df = 19$; $p < .004$). There was also a significant main effect for repetitions (C→C and E→E patterns) ($F_{1,19} = 169.3$, $p < .0005$). It emerged that Eve was more likely to persist with a correct form rather than an erroneous form when all forms of negative feedback are considered ($t = 3.32$, $df = 19$; $p < .002$). However, the comparison with 'pure' forms of negative-feedback-only revealed fairly similar levels of repetition ($t = 0.73$, $df = 19$; ns). It would seem, therefore, that when clarification requests are not fulfilling a corrective function, the child is likely simply to repeat a given linguistic form, be it grammatical or ungrammatical. Overall, though, it is clear that the child does not simply vacillate randomly between grammatical and ungrammatical forms. Thus, non-error-contingent clarification requests do not encourage the child to abandon grammatical forms in favour of their ungrammatical counterparts. And consistent with their projected corrective function, error-contingent clarification requests (negative feedback) *do* encourage shifts in the opposite direction, from ungrammatical to grammatical.

Discussion

It has emerged that Eve responds differentially to the four categories of adult input investigated here. Specifically, her speech becomes more grammatical, across a wide range of linguistic categories, in response to negative evidence and negative feedback, when compared against adult move-ons and positive input. This general pattern does not obtain for the entire nine-month sampling period, but is confined instead to the later stages of acquisition, beyond the point where grammatical forms feature on 50% of occasions in child speech. Apparently, therefore, child responsiveness to negative input varies quite markedly according to the particular phase of development sampled.

It also emerged that, of the two indices investigated, Use Correct responses distinguished among the input conditions far better than Persist-with-Error responses. Thus, the data on Use Correct responses provide the clearest indication that the child *does* sometimes attend to negative input and shed ungrammatical forms in favour of their grammatical counterparts.

Both Persist-with-Error and Child Move-On responses may indicate those occasions when the child has failed to detect available corrective input. Certainly, there is no reason why the child should attend to every instance of relevant input information, in whatever sphere of child language development. It would be surprising, in fact, if the child were proven capable of such a feat. Of course, the fact that some seed will inevitably fall on stony ground is not necessarily problematic. As Nelson's (1987) rare event theory suggests, the timing and quality of key input events is likely to be far more important than their overall frequency. This perspective also provides an explanation for why Use Correct responses are so heavily outnumbered by PE and CMO responses. But the absolute frequency of UC responses is perhaps less important than the child's stage of development (in Nelson's terms, their level of linguistic readiness) and the level of attentiveness exhibited on a given occasion. Another possible interpretation for the incidence of both PE and MO responses is that corrective information *is* in fact processed, but off-line. Thus, the child may attend to corrective input, but limitations on processing resources may not always permit the child to incorporate this cognisance into a current speech output plan. Hence, errors may persist in the child's speech from time to time, despite the covert impact of corrective input.

The findings reported here parallel those of Farrar (1992), in which so-called corrective recasts elicited significantly more Use Correct responses than positive input. As mentioned, Farrar identified three categories of positive input. Of these, so-called non-corrective recasts correspond closely to the category of positive input investigated here, in so far as they comprise adult utterances which model target structures in a non-error-contingent context. Corrective recasts,

meanwhile, are presented by Farrar (1992) as a sub-set of recasts more generally, being distinguished by the correction of a target error. More specifically, the adult "reformulates the child's sentence by correcting a particular noun or verb phrase by means of a grammatical morpheme" Farrar (1992:92). Clearly, the adult responses embraced by Farrar's category closely parallel those within the purview of negative evidence as defined here. The advantage of the latter term derives from its grounding in a clearly articulated theory dedicated to the issue of corrective input, avoiding, in the process, the pitfalls of discussion centred on the more nebulous, less directly relevant category of recast (see Introduction and Saxton 1997).

The findings on adult move-ons serve to confirm the general pattern of results, effectively suggesting that, when adults do not respond to errors with negative input, the child is far less likely to switch from erroneous to correct forms. As mentioned above, Morgan et al. (1995) also investigated a category of error-contingent, non-corrective input, which they termed move-ons. In their study, also including data from Eve, the effects of recasts versus move-ons were statistically indistinguishable. It will also be recalled, however, that many move-ons were coded in cases where the adult models a correct form directly contingent on a child error. In fact, something like 25% of move-ons were of this kind. There is, then, an unfortunate blurring of the categories of corrective and non-corrective input. Had these two categories been more rigorously distinguished, it is likely that Morgan et al.'s findings would be in much closer agreement with those reported here and in Farrar (1992). In any event, extant studies all indicate that negative input is closely associated with the rejection by the child of their own erroneous forms, in favour of grammatical alternatives.

On a methodological point, the present study illustrates how the particular language sample taken from subjects can have a profound influence on the outcome of empirical enquiry. In itself, there is nothing new or surprising in this observation. At the same time, it is clear that very little attention has been paid in previous studies to how the age of subjects or, more to the point, their developmental level, impact on

responsiveness to corrective input. Thus, a wide range of subject ages is reported in the literature, with, for example, subjects as young as 1;6 (Moerk 1991) and as old as 5;0 (Hirsh-Pasek et al. 1984). Inevitably, therefore, these studies encompass a very wide range of developmental stages. A related problem is that individual linguistic structures follow separate developmental paths, with some structures being acquired earlier and more rapidly than others. A typical cross-sectional sample of child language will therefore be highly heterogeneous in this regard. In consequence, sampling methods which ignore this important source of variation inevitably prevent one from establishing a viable basis for comparison across linguistic structures. It is unfortunate, therefore, that this factor is generally given scant attention in the literature.

A notable exception is provided by Morgan et al. (1995), who report data on a sample defined in terms of the child's acquisition level. This method was adopted here, with the critical developmental level also taken as the point at which 50% grammaticality was attained for each structure. In future work, it would be interesting to move beyond this 50% cut-off point and refine further the identification of the point at which children become susceptible to corrective input. By examining alternative levels of child accuracy (30%, 40%, 60%, 70% and so on), it should be possible to converge on the optimal phase in development when children become sensitive to, and able to take advantage of, whatever corrective information is available. In this enterprise one must, of course, accommodate the possibility that individual children may vary in development, and furthermore, that individual grammatical structures may show variation also.

Based as it is on naturalistic conversational data, the present study cannot control for prior knowledge and experience as a factor in the child's responses. In particular, events in the conversation just prior to the utterances which are actually coded may be critical determinants of the child's responses. Experimental approaches can avoid this problem by strictly controlling the information available to the child. Thus, in previous work (Saxton 1997; Saxton et al. 1998), children

have been taught novel verb forms in a context where the input available to the child has been carefully controlled. The problems of naturalistic data have also been obviated in a number of other intervention studies (e.g., Camarata, Nelson & Camarata 1994; Nelson, Camarata, Welsh, Butkovsky, & Camarata 1996; Fey, Cleave, Long, & Hughes 1993; Fey, Krulik, Loeb, & Proctor-Williams 1999; see Saxton et al. 1998, for further discussion). Of course, naturalistic studies remain vital for the greater degree of ecological validity they can confer when set against experimental studies. In brief, it is important to investigate the extent to which parents actually supply negative input and the extent to which children can identify and respond to any such input in an appropriate matter.

Information about grammar from the discourse context

The comparison between negative evidence and positive input allows one to test the importance of the discourse context on child responsiveness. Traditionally, nativist descriptions of the input have drawn no distinction between these two forms of input, arguing that any and all instances of linguistic forms can be classified as positive input. In fact, there is nothing inherently nativist about this position, but it has been closely associated with nativist theorists (e.g., White 1989; Marcus 1993). In the event, it has emerged that the discourse context has a profound influence on child responsiveness, since the child is far more likely to produce the adult form when it occurs directly contingent on a child error than in any other context (see also Saxton 1997; Saxton et al. 1998). In consequence, it becomes more difficult to dismiss the child's Use Correct responses as mere imitation. In the case of negative feedback, of course, the adult does not model the correct form for the child, so imitation can not be held to account for the child's UC responses. Negative evidence, on the other hand, may inspire imitation on occasions. But the differentials in UC responding observed

between negative evidence and the two non-corrective input types would be difficult to explain if imitation alone were responsible for the child's responses.

When one compares negative evidence and adult move-ons, it is perhaps not surprising that the former category encourages higher levels of Use Correct responding, since, of the two categories, only negative evidence supplies the adult model. However, it should be recalled that the equivalent comparison between positive input and adult move-ons revealed no significant difference between the two, even though positive input also models the target structure for the child. Evidently, therefore, negative evidence places a special pressure on the child to produce grammatical forms in their own immediate speech output. Of course, in supplanting an erroneous form of their own with a correct version modelled by the adult, the child is responding in a manner entirely consistent with the idea that the adult input genuinely represents a form of *corrective* information.

Turning to negative feedback, it should be recalled that this form of negative input does not model the target structure for the child. In this respect, it is very similar to adult move-ons, since both categories comprise error-contingent responses from which the adult model is absent. Yet the difference in levels of child responsiveness is quite dramatic, since E→C shifts are far more frequent for negative feedback. More impressive yet is the comparison between negative feedback and positive input, since Use Correct responses were more frequent following negative feedback. It would seem, then, that the simple presence of the adult model provides no special stimulus for the child to adopt it in her own speech output. Negative feedback, on the other hand, does encourage relatively high levels of UC responses. Again, the act of switching from erroneous to correct following the intervention of negative feedback is consistent with its projected corrective function. Moreover, the data on *non*-error-contingent clarification requests revealed quite clearly that the analogous switch (Correct→Erroneous) was far less frequent, a finding which confirms that clarification requests do not function as a generalised stimulus, causing

the child to vacillate between functionally equivalent linguistic forms (erroneous and correct.

In summary, two forms of error-contingent input categories are identified within the contrast theory. One supplies the correct adult model (negative evidence), while the other does not (negative feedback). Two bases of comparison were investigated, one which supplies the correct adult model in *non*-error-contingent contexts (positive input) and one which is contingent on errors, but which supplies no model (adult move-ons). It was found that presence or absence of the adult model is not the critical factor which encourages the child to produce grammatical forms in their own immediate speech output. Furthermore, the findings on adult move-ons reveal that simple contingency of an adult response on a child error is not sufficient to improve the grammaticality of child speech. Why then do negative evidence and negative feedback have such a marked influence on the grammaticality of child speech? In the case of negative evidence, the immediate juxtaposition of child and adult forms creates a direct contrast between the two. It was argued that this contrast effectively signals to the child that the adult form is preferred *in_place of* the child form. Negative feedback, on the other hand, is ideally designed as a prompt, which, when the child elects to focus on grammar, can cue recall of linguistic structures for which the child has not yet achieved perfect mastery.

General availability of negative input

The current study provides a strong indication that, not only was Eve supplied with negative input, but that she was able to identify and respond to that input in an appropriate manner. The experimental studies mentioned above underscore this finding. Nevertheless, to be of any abiding theoretical interest, it is clear that one must also demonstrate the general availability of negative input to children. And on this point, disagreement persists (Bohannon et al., 1996; Morgan, 1996). The issue of

generality with respect to corrective input comprises two parts. First, is negative input available for all children? And second, is negative input available for all grammatical structures being acquired by the child? If the answer to the first of these questions is no, then one can rule out negative input as a necessary component of language acquisition (Pinker 1989). Unfortunately, the simple logic of this point ignores the deep unlikelihood that the issue will ever be resolved empirically. Given that child language studies typically sample only a tiny fraction of the input supplied to children, there always remains the chance that critical but low frequency events will be missed. As it happens, the literature on corrective input reveals that in all cases where data on individual children are cited, negative input *is* supplied (see Introduction).

As mentioned, the question of generality can also be applied to the object of learning, since it would be useful to know if negative input is available for all grammatical categories, or a subset only. Unfortunately, though, the majority of empirical studies on negative input conflate data on individual grammatical categories (e.g., Hirsh-Pasek et al. 1984; Bohannon & Stanowicz 1988). That said, three studies, including the present one, do distinguish separate aspects of grammar (see also Farrar 1992; Morgan et al. 1995). Of importance is the fact that negative input is available for all of the grammatical categories investigated thus far. Most of the categories investigated comprise morphosyntactic categories, such as auxiliary verbs, the be copula, and past tense marking. Undoubtedly, one reason for this focus on morphology is that child errors are sufficiently abundant to permit meaningful statistical analyses to be performed on the data. Many syntactic errors, by contrast, occur far less frequently and may even be missed altogether by current sampling practices. However, two syntactic errors which do not suffer from this disadvantage are subject and object omissions. Accordingly, these two categories were investigated in the present study with interesting results. Generally speaking it was found that the patterns of both adult and child behaviours were remarkably similar for both morphosyntactic and syntactic categories. Thus, both negative evidence and negative

feedback were supplied in both cases, and moreover, both kinds of error encouraged shifts from erroneous to correct on occasion. In fact, as Table 3 reveals, child responsiveness was especially pronounced for the two syntactic categories. These data therefore present the intriguing possibility that the child may utilise corrective input in acquiring knowledge of the obligatory status of grammatical subject and object in English. At the very least, it is apparent that explanations which rely exclusively on innate constraints must demonstrate that negative input is not responsible for the acquisition of these aspects of grammatical knowledge.

Generally speaking, it is apparent that empirical research has only just begun to address the twin aspects of the generality question with any seriousness. As a single case study, the present investigation contributes more to the issue of which aspects of grammar, rather than which children, are subject to correction. In this regard, the present study extends the scope of linguistic structures examined, when compared with previous studies. Thus, a wider range of morphological categories is included here (nine) than either Farrar (1992) (seven categories) or Morgan et al. (1995) (two categories). And, of course, two purely syntactic categories are also included here. And as the above discussion indicates, Eve is by no means an isolated case when it comes to observing the effects of such input. Thus, while far more research is clearly needed, the provision of negative input would seem to be far more widespread than is commonly believed.

Concluding remarks

Hitherto, all empirical studies directly concerned with negative input report the incidence of adult responses which bear a clear corrective potential. Even Brown & Hanlon (1970:197), who focused on explicit markers of Approval and Disapproval (e.g., *Yes, that's right; No, don't say that),* remark that 'repeats of ill-formed utterances usually contained corrections and so could be instructive.' The reanalysis of some of

their original data, reported here, bears out this early observation. It is perhaps unfortunate, therefore, that such repetitions were deliberately excluded from their analyses. Historically, nativist views on the (non-)occurrence of negative input might have been radically different had Brown & Hanlon made this crucial insight the focus of their research. It has been argued elsewhere (Saxton 1997; Saxton et al. 1998) that the presence or absence of negative input is of little relevance in resolving issues about the nature of the child's genetic endowment for language. It is highly relevant, however, in discussions of how the child manages to solve the retreat problem and achieve a mature, adult-like system of grammar. Negative input provides the most obvious possible solution to this problem, but is by no means the only suggestion which has been made in the literature. Among the most prominent explanations for how the child might solve the retreat problem are: Chomsky's (1981) notion of indirect negative evidence; the Uniqueness principle (Wexler & Culicover 1980); the subset principle (Berwick & Weinberg 1984); the catapult mechanism (Randall 1992); an improvement in memory retrieval processes (Marcus et al. 1992); and an increasing ability to make use of relevant input cues (Brooks & Braine 1996). Others have argued that, in effect, there is no retreat problem because language acquisition can proceed irrespective of child errors and negative input (Rohde & Plaut, 1999; Marcus, 1999). It is important to recognise that many of these alternative suggestions are not mutually exclusive. It may emerge that the child draws on multiple sources of input information, in addition to innate resources, in arriving at a mature grammar (c.f. Hirsh-Pasek & Golinkoff 1996). In tandem with several other studies, mentioned above, the present study indicates that negative input may well be one such resource which is available to the child. The present study has also demonstrated that the child can respond appropriately to corrective input, at least in the short term. Moreover, given the precepts of the contrast theory, it has also been argued that a viable theoretical framework is now available for exploring further the role of negative input in child language acquisition.

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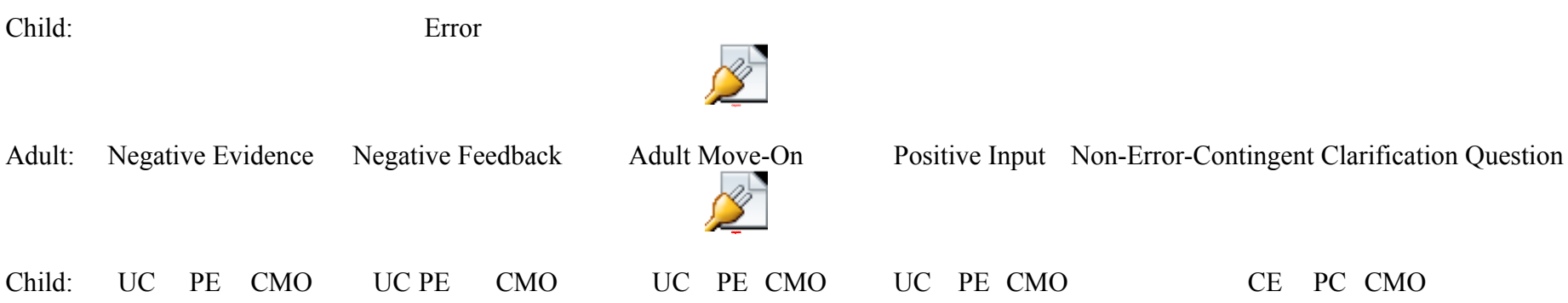
Table 1
Child utterances exemplifying eleven categories of grammatical error.

Structure	Examples
a. Present progressive (auxiliary)	Eve crying. Car coming
b. Prepositions	Fraser tape recorder floor. Fraser, Eve put napkin wastebasket.
c. Plural -s	Rubber pant. I cut scissor.

d. Irregular past tense	Eve... Eve... Eve run Papa study. Where it goed?
e. Auxiliary verbs (excluding (a))	I better blow it. I tie other one.
f. Possessive	In Papa study. Oh, Papa, take... take dollie coat off.
g. Noun phrase specifier	That zebra. Where's lady finger?
h. 3rd person singular -s	My pencil go in there. He want some milk out the cup.
i. Be copula	I sick. What that?
j. Subject (omission)	Spill soup. Want some grape juice.
k. Object (omission)	Mommy get. Cromer have bring on Wednesday.

Figure One
Patterns of discourse coded for in Eve's data



Key: UC: Use Correct
PE: Persist-with-Error
CE: Change-to-Error
PC: Persist-with-Correct
CMO: Child Move-On

Table 2
Child responses to four kinds of adult input (negative evidence; negative feedback; move-ons; positive input)

Structure	Negative Evidence			Negative Feedback			Adult Move-Ons			Positive Input		
	UC	PE	CMO	UC	PE	CMO	UC	PE	CMO	UC	PE	CMO
Progressive (aux)	3	42	166	1	37	100	3	60	193	2	134	231
Prepositions	10	24	93	5	12	27	2	16	61	85	88	823
Plural -s	3	14	46	0	8	14	2	13	38	27	53	180
Irregular past	2	1	24	1	5	33	1	6	51	18	23	381
Auxiliary verbs	4	19	154	4	19	72	3	45	256	29	184	1379
Possessive 's	2	18	74	0	16	25	0	37	137	2	28	90
NP specifier	31	77	317	22	61	177	15	132	325	131	254	1223
3PS	1	2	20	0	2	10	0	13	31	6	14	123
Be copula	37	116	435	12	60	205	8	95	255	51	445	859
Subject	46	21	122	15	16	58	19	21	54	130	203	1050
Object	18	10	54	9	5	23	3	15	23	148	80	1156
Total	157	344	1505	69	241	744	56	453	1424	629	1506	7495
(%)	7.8	17.2	75.0	6.6	22.9	70.6	2.9	23.4	73.7	6.5	15.6	77.8

Key: UC: Use Correct
PE: Persist-with-Error
CMO: Child Move-On

Table 3
Percentage Use Correct responses following corrective and non-corrective input

Structure	All Data				Data from 50% Accuracy			
	Negative Evidence	Negative Feedback	Adult Move-Ons	Positive Input	Negative Evidence	Negative Feedback	Adult Move-Ons	Positive Input
Prog (aux)	1.4 (3)	0.7 (1)	1.2 (3)	0.5 (2)				
Prepositions	7.9 (10)	11.4 (5)	2.5 (2)	8.5 (85)	15.8 (6)	23.1 (3)	5.4 (2)	11.6 (80)
Plural -s	4.8 (3)	0.0 (0)	3.8 (2)	10.3 (27)	15.8 (3)	0.0 (0)	8.7 (2)	1.0 (2)
Irregular past	7.4 (2)	2.6 (1)	1.7 (1)	4.3 (18)	12.5 (2)	3.5 (1)	2.3 (1)	3.2 (9)
Auxiliary verbs	2.2 (4)	4.2 (4)	1.0 (3)	1.8 (29)	6.7 (1)	16.7 (1)	0.0 (0)	4.2 (10)
Possessive 's	2.1 (2)	0.0 (0)	0.0 (0)	1.7 (2)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
NP specifier	7.3 (31)	8.5 (22)	3.2 (15)	8.2 (131)	16.0 (17)	18.2 (14)	3.4 (6)	9.7 (88)
3PS	4.2 (1)	0.0 (0)	0.0 (0)	4.2 (6)	50.0 (1)	0.0 (0)	0.0 (0)	7.3 (3)
Be copula	6.2 (37)	4.3 (12)	2.2 (8)	3.7 (50)	0.0 (0)	33.3 (1)	0.0 (0)	14.9 (10)

Subject	24.1 (46)	15.9 (14)	20.2 (19)	9.4 (130)	29.3 (36)	19.3 (11)	24.3 (18)	10.9 (115)
Object	21.7 (18)	24.3 (9)	7.3 (3)	10.7 (148)	22.0 (18)	24.3 (9)	7.3 (3)	10.7 (148)
Mean	7.8 (157)	6.6 (69)	2.9 (56)	6.5 (629)	20.5 (84)	17.4 (40)	7.1 (32)	9.5 (465)