(severe reception problems; sister and baby start playing. A few minutes later baby turns to mother)

Baby: *I want to ride the horse too.*

Mother: *OK, go ride your horse on the porch.*

(baby goes outside, returns shortly, turns to mother)

Baby: *I want to watch 'Sesame Street'.*

Mother: *Sweetie, it's not on now.*

Sister: *It's over.*

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Feedback to first language learners: the role of repetitions and clarification questions*

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ABSTRACT

The conclusion that information regarding the grammaticality of children's speech is unavailable in parental input has recently been challenged (Moerk 1983*a*, *b*, Hirsh-Pasek, Treiman & Schneiderman 1984). The present study expanded on this research by broadening the definition of 'negative feedback' and by describing individual styles of mother–child dialogues. The purpose was to investigate whether mothers of four 2-year-old children responded differentially to their children's well-formed or ill-formed utterances with explicit and implicit feedback. The middle-class, English-speaking, mother–child dyads were recorded in a naturalistic context at home during play and eating activities. Explicit and implicit feedback were different in terms of the proportion of responses available to the child and their relation to well-formed and ill-formed utterances. The style of response was similar for most analyses across the four mothers.

INTRODUCTION

The issue of whether negative feedback to agrammatical utterances plays any role in children's early language development was for many years presumed settled on the basis of Brown & Hanlon's findings (1970) that

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mothers neither provided responses of approval and disapproval differentially to well-formed and 'primitive' (ill-formed) child utterances, nor were more likely to produce *nonsequiturs* (responses indicating mis- or non-comprehension) after ill-formed utterances. The conclusion that parental responses are unavailable to help children correct wrongly formulated rules or restrict overgeneralized rules has been incorporated into recent attempts to develop learnability models (Pinker 1979, 1984, Wexler & Culicover 1980) as well as into generally accepted assumptions about the helpfulness of parental input to children (see comment by Hakuta 1985).

The hypothesis that differential responses to well-formed versus ill-formed utterances are lacking in parental input has more recently been challenged on a number of grounds. First, Brown & Hanlon (1970) considered a narrow range of responses – only those that expressed explicit approval or disapproval in one analysis, and only responses to questions and to negatives in their analysis of communication pressure. Secondly, only those responses that immediately followed the child's utterances were analysed. All opportunities for correction that occurred subsequent to the first maternal response would have been overlooked by the investigators.

As pointed out by Moerk (1983*a*, *b*), much parental speech in addition to approval or correction relates closely to preceding child speech, and could be informative about various aspects of the child's utterances. It seems likely that children could interpret responses other than explicit disapproval as negative feedback. In fact, Brown & Hanlon (1970) started from precisely this assumption in their analysis of *sequiturs* versus *nonsequiturs*: 'Surely the well-formed utterance, since it would be correctly interpreted, is a superior tool to the ill-formed utterance, which must often be misunderstood or simply not comprehended' (p. 42). Failures to understand, signalled for example by repetitions or clarification questions, seem to be prime candidates as implicit negative feedback to ill-formed utterances, and it seems worthwhile to assess their occurrence after a wider range of child utterances than Brown & Hanlon considered.

In an attempt to replicate Brown & Hanlon's study (1970), Hirsh-Pasek *et al.* (1984) confirmed the conclusions regarding explicit feedback, but suggested a different interpretation for implicit responses. They reported that adults are more likely to repeat ill-formed than well-formed utterances in conversation with 2-year-olds, but not with 3- and 4-year-old children. However, the exact nature of the repetitions used by the mothers in the Hirsh-Pasek *et al.* study is unclear. Repetitions of a preceding speaker's utterance can be used for a variety of discourse functions, including confirmation and request for clarification. These functions can typically be distinguished by intonation, but no such distinction was made by Hirsh-Pasek *et al.* Also, like Brown & Hanlon, Hirsh-Pasek *et al.* analysed only the adjacent maternal responses to child utterances. In order to determine the usefulness

of maternal responses as a source of negative feedback, it seems imperative to distinguish between clarifying and non-clarifying (confirming) repetitions, and to consider all maternal responses as possible sources of information.

The proposed model for investigating the possible sources of negative feedback in parental responses rests upon a notion of communication as prerequisite to language. Before having learned much about grammar *per se*, children are typically extremely sophisticated communicators, who clearly understand that vocal and gestural acts are meant to have an effect on the partner. If children are, indeed, attempting to communicate with words, then any parental response that frustrates or postpones their desired illocutionary effect – that is, slows or breaks the flow of conversation – may be immediately understood as negative. In verbal discourse, repetitions and clarification questions may represent such frustrations or postponements, and as such may function as implicit negative feedback. Whereas, responses that continue the conversation with minimal disruption may function as implicit positive feedback. It is crucial to investigate the differential use of responses like these, which children themselves are capable of understanding as negative and positive feedback, before the possibility that parental responses can help children to revise incorrect or overgeneralized rules is rejected.

The present study (*a*) describes two types of feedback (explicit and implicit) in the responses of four mothers to their 2-year-old children and (*b*) investigates whether these mothers respond differentially to their children's well-formed and ill-formed utterances with either type of feedback. Since both developmental and individual differences may exist in the nature of maternal responses, the analyses are presented separately for the four children. Two hypotheses were tested: (*a*) that only implicit feedback is differentially produced in response to well-formed and ill-formed child utterances, and (*b*) that the predominant maternal responses to well-formed and ill-formed utterances are conversation-furthering utterances (which we call 'move-ons') and clarification questions, respectively; confirming repetitions will vary as a function of maternal style. Five questions were addressed.

(1) If one considers both implicit and explicit feedback, and non-adjacent as well as adjacent feedback, how much feedback is available in speech to young children?

(2) Is negative feedback produced differentially to ill-formed child utterances, and positive feedback differentially to well-formed utterances?

(3) When negative feedback occurs, what kind of language breakdown (semantic, syntactic, lexical, phonological) causes it?

(4) Does implicit feedback co-occur with explicit feedback in such a way as to increase the informational value of either kind of feedback to the child?

(5) Are there large differences among mothers in their styles of providing feedback to their children?

METHOD

Subjects

Four middle-class, monolingual, English-speaking mother–child pairs were subjects. The mothers were all college-educated and had a variety of occupations. All the children were first born and approximately two years of age. Three of the four children were primarily cared for in the home during the day and the fourth (Amy) was enrolled in a day-care facility for eight hours a day. Table 1 lists the chronological age, sex, mean length of utterance in morphemes (MLUs; Brown 1973) and mean length of response in words (MLRs; Shatz & Gelman 1973).

TABLE 1. *Age, sex* MLU *and* MLR *for each child*

Name	Age	Sex	MLU	MLR
Alex	2;0.23	M	3·52	3·26
Amy	2;0.04	F	2·44	2·17
	2;3.18		2·62	2·31
Ben	1;11.25	M	3·20	2·98
Jim	2;0.18	M	3·36	3·14

Collection and transcription of language samples

The language samples were chosen from a sequence of transcripts collected over a period of six to eight months. The 30- to 45-minute sample with a minimum MLU of 2·2 that was the most naturalistic was chosen for each child (e.g. the mother and child at home playing with toys or eating). In each case, the samples were among those collected towards the end of the six- to eight-month period. Consequently, the children were familiar with the recording equipment and procedure. Because the transcripts for one child were too short for analysis (at least 114 conversational turns were analysed per dyad), two language samples that were similar in MLU and context were used.

The sessions were audiorecorded and transcribed by one experimenter (usually the observer), who was familiar with the mother–child dyad, and checked by a second experimenter. A third person (MJD or KP) listened to the tapes for confirmation of intonation contours and utterance boundaries.

Coding of child utterances and maternal responses

In previous studies (Brown & Hanlon 1970, Hirsh-Pasek *et al.* 1984) only multi-word child utterances and the adjacent maternal responses were analysed. In our attempt to analyse as much of the conversation as possible, a coding scheme was devised that initially included all mother and child utterances. Child utterances – both single and multi-word – were categorized

in terms of their well-formedness. Maternal responses were judged to be either EXPLICIT feedback, which included expressions of approval, disapproval or correction, or IMPLICIT feedback, which included requests for clarification, repetitions, or conversational responses indicating full uptake. General guidelines for coding the child utterances and maternal responses are described below. The complete coding scheme, with examples, is presented in the Appendix.

Child utterances. Child utterances were judged to be well formed (WF), ill formed (IF) or other (O). The major criterion for coding an utterance as one of the three categories was whether the utterance was semantically, syntactically and phonologically appropriate for the context in which it was spoken. Utterances were coded as IF if they (*a*) included any morphological, syntactic, lexical, phonological or pragmatic errors (including omissions); (*b*) consisted of meaningful words in combination with uninterpretable vocalizations; or (*c*) were left incomplete. Utterances coded as O included all laughs, vocalizations and completely unintelligible utterances.

Explicit maternal responses. Only those responses that were judged to be approvals or disapprovals of the child's preceding utterance were coded as explicit feedback. Words such as *yes* and *that's right* were counted as explicit approval (A); and words such as *no*, *that's not right*, were counted as explicit correction (C). In addition, the word *yeah* was coded as an A if it was judged not to be a conversation filler, and any utterance that corrected the child's utterance by providing contradictory information was coded as a C. Expressions of approval or disapproval of the child's behaviour were not accepted as explicit feedback for his/her speech. The most commonly used word in this case was *good* for approval of the child's activity.

Implicit maternal responses. Unlike explicit feedback, all maternal responses were judged to be one of three categories: repetitions (R), clarification questions (CQ) and 'move ons' (MO). The first decision in coding the implicit feedback was whether the response was an R or a CQ. If the maternal response was not one of those two types, then it was judged to be an MO. MOs were responses that continued the conversation or that began a new topic, without either questioning or repeating (parts of) the child's preceding utterance. If a maternal response was judged to be unintelligible, it and the preceding child utterance were excluded from the analysis (this occurred only once).

Repetitions (Rs) typically either mimicked the child's intonation or had a more pronounced, falling intonation, indicating confirmation. A maternal response with a rising intonation, typical of a yes–no question, was not coded as an R but as a CQ, even if it contained some repetition of the child's

preceding utterance. Four types of repetitions were coded: exact (Exact-R), contracted (Con-R), expanded (Exp-R), and extended (Ext-R). Contracted and expanded Rs provided a syntactic or morphological correction, a Con-R being a shorter utterance than the child's and an Exp-R being longer. Ext-Rs were those that added new information to the child's utterance. The alternation of deictic forms (e.g. substitution of *you* for *me*, *come* for *go*) did not disqualify an utterance as an R.

CQs were responses that directly referred to the child's previous utterance, and were attempts to clarify the signal or some portion of it, or the child's intended meaning. There were four types: wh-, yes/no, occasional, and repetition CQs. Repetition CQs were subcategorized in the same way as the Rs (see above). If the CQ was a tag (T), it was coded as such.

Reliability. Two coders judged all child utterances and maternal responses for each of the four children. Point-by-point interscorer agreement calculated separately for the child utterances, explicit maternal responses and implicit feedback yielded reliability estimates of 91%, 98% and 96%, respectively.

Conversational analysis

The unit of analysis was one 'turn' exchange in the conversation, that is, a consecutive sequence of child utterances and maternal responses. For example, two turn exchanges are illustrated below:

Jim:	Mother:
this is a big machine/	
	Oh, this I recognize.
	This is a tool bench.
hammer/	
a tool bench/	
tool bench/	
	Tool bench.
	Look, here's the hammer that goes with it.

The conversations were analysed in two steps: first, a sequence of child utterances and the adjacent maternal responses (both implicit and explicit) were tabulated; then all maternal responses that came after the first one were analysed separately as a sequence.

All child utterances that fell into the O category (laughs, vocalizations, etc.) and their corresponding maternal responses were excluded from the analysis. Similarly, all maternal responses that were coded as laughs or unintelligible utterances and their preceding child utterances were excluded.

RESULTS

The results are presented in five sections that parallel the questions addressed above.

Availability of feedback

A possible source of negative feedback can be found in both the maternal responses adjacent to the child's utterance and the sequences of responses that follow. Table 2 describes the availability of both explicit and implicit feedback in adjacent maternal responses to child utterances. Whereas only an average of 15 % of adjacent maternal responses provided explicit approval of

TABLE 2. *Percentage of adjacent explicit and implicit responses*

	Explicit responses			Implicit responses		
Child	A	C	NR[a]	R	CQ	MO
Alex	14	5	81	25·2	25·2	49·6
Amy	10	5	85	20·0	35·8	44·2
Ben	19	0	81	29·8	26·3	43·9
Jim	14	3	83	16·8	17·6	65·6

[a] NR represents those remaining maternal responses that were not judged to be either an A or C response.

the preceding child utterance – an average of 50 % were classified as MOs – the response we suggest constitutes implicit approval. Similarly, an average of 3 % provided explicit correction, whereas 26 % were CQs – responses that we argued would provide implicit negative feedback.

Sequences of explicit maternal responses were either absent or very rare in three out of the four mothers' dialogues: two mothers produced none, and the other mother produced one sequence of A, C, A. For example, Alex's mother produced the following sequence of C responses:

Alex:	Mother:
orange juice/	
	No.
	That one's not orange.

Sequences of implicit maternal responses, in contrast to explicit responses, were frequent in three of the four mothers. Ben's mother produced the following sequence of CQs:

Ben:	Mother:
do something different now/	
	Do something different now?
	What are we gonna look at now?

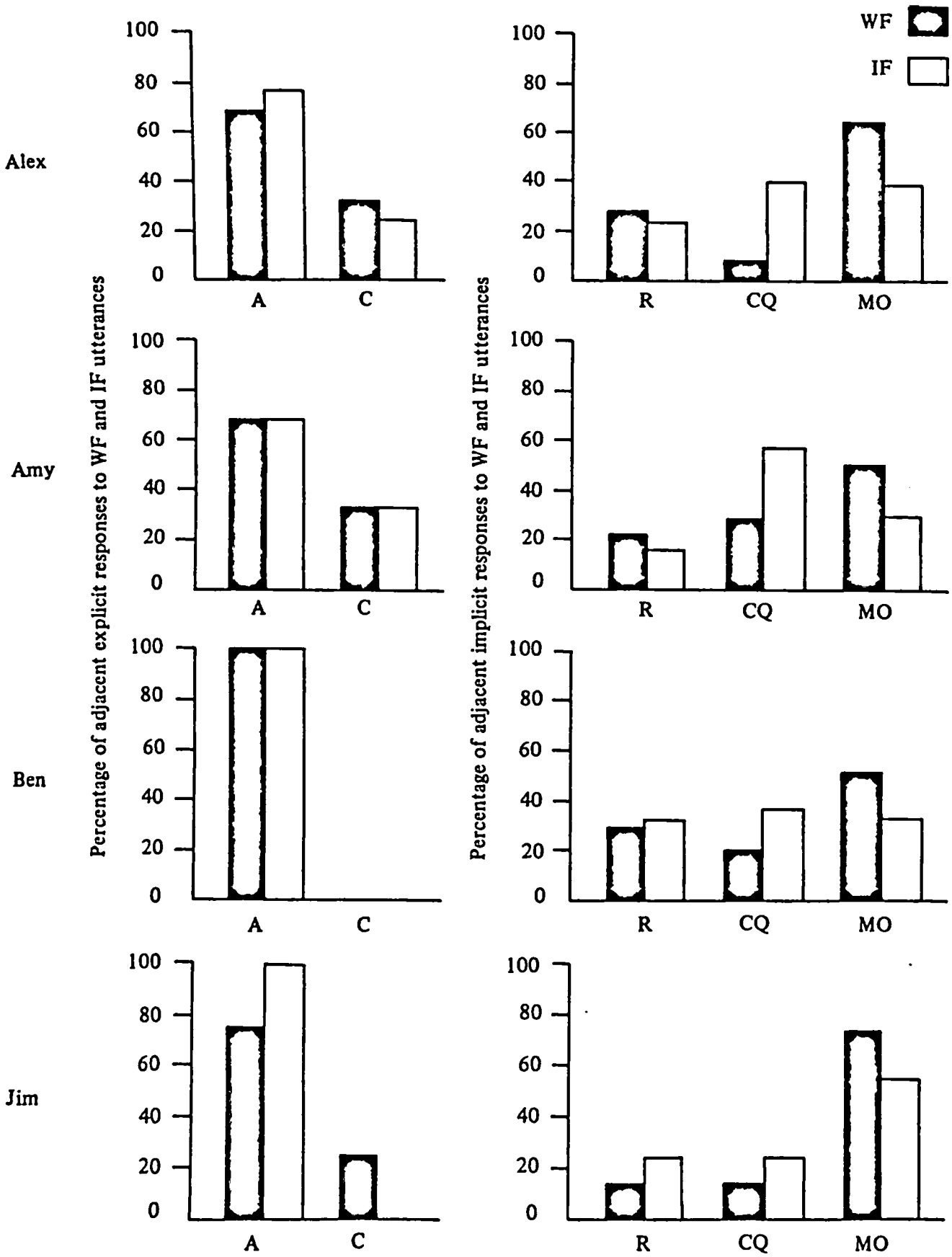

Fig. 1. Percentage of adjacent explicit and implicit maternal responses to WF and IF utterances.

When both the adjacent responses and non-adjacent sequences are considered, implicit feedback appears to be a much more potent source of information to child language learners than is explicit feedback. This would be especially true if the implicit responses are provided differentially to WF and IF utterances.

Differential responses

The proportion of adjacent explicit and implicit responses that followed WF and IF utterances is shown in Fig. 1. As can be seen, the adjacent explicit responses were not differentially related to the well-formedness or ill-formedness of the child's utterances. In fact, Cs were equally or more likely to follow WF utterances, and As were somewhat more likely to follow IF utterances.

In contrast to the explicit responses, the implicit responses were differentially produced to WF and IF child utterances. In all dyads, the predominant response to WF utterances was an MO; and, in three of the four mothers, the predominant response to IF utterances was a CQ. In addition, the percentage of WF utterances that preceded MOs was greater than the percentage that preceded either Rs or CQs; and the percentage of IF utterances that preceded CQs was greater than the percentage that preceded MOs and Rs. Thus, examining conditional probabilities in both directions reveals the strength of association between the child utterances and maternal responses. Not only is a child more likely to receive a CQ to an IF than to a WF utterance, but receiving a CQ indicates a higher probability that he made an IF sentence (Table 3).

The production of R responses varied across the mothers, but was in all cases less differentiated as a function of well-formedness than the CQs and MOs. Because of the lack of differentiation in R responses, a second, more detailed analysis was completed to investigate whether a relationship could be seen between the type of R and the child's utterance being WF or IF. The results are shown in Fig. 2.

In all cases, Exact-Rs followed more WF than IF utterances; whereas in three out of the four mothers an Ext-R was more likely to follow IF than WF utterances. Jim's mother produced a Con-R as the predominant response to IF utterances. Alex's mother demonstrates the most differentiation in terms of R responses, whereas Amy's mother demonstrates very little.

Source of communicative breakdown

One of the predominant conclusions of Brown & Hanlon's study (1970) was that mothers directed their explicit responses (both approval and disapproval) to the semantic content rather than syntactic form of their child's utterance. With one exception, our results confirm those of Brown & Hanlon: almost all explicit maternal responses were directed to the meaning or truth value of the child's utterance. The one exception was an approval of the child's having said 'please'.

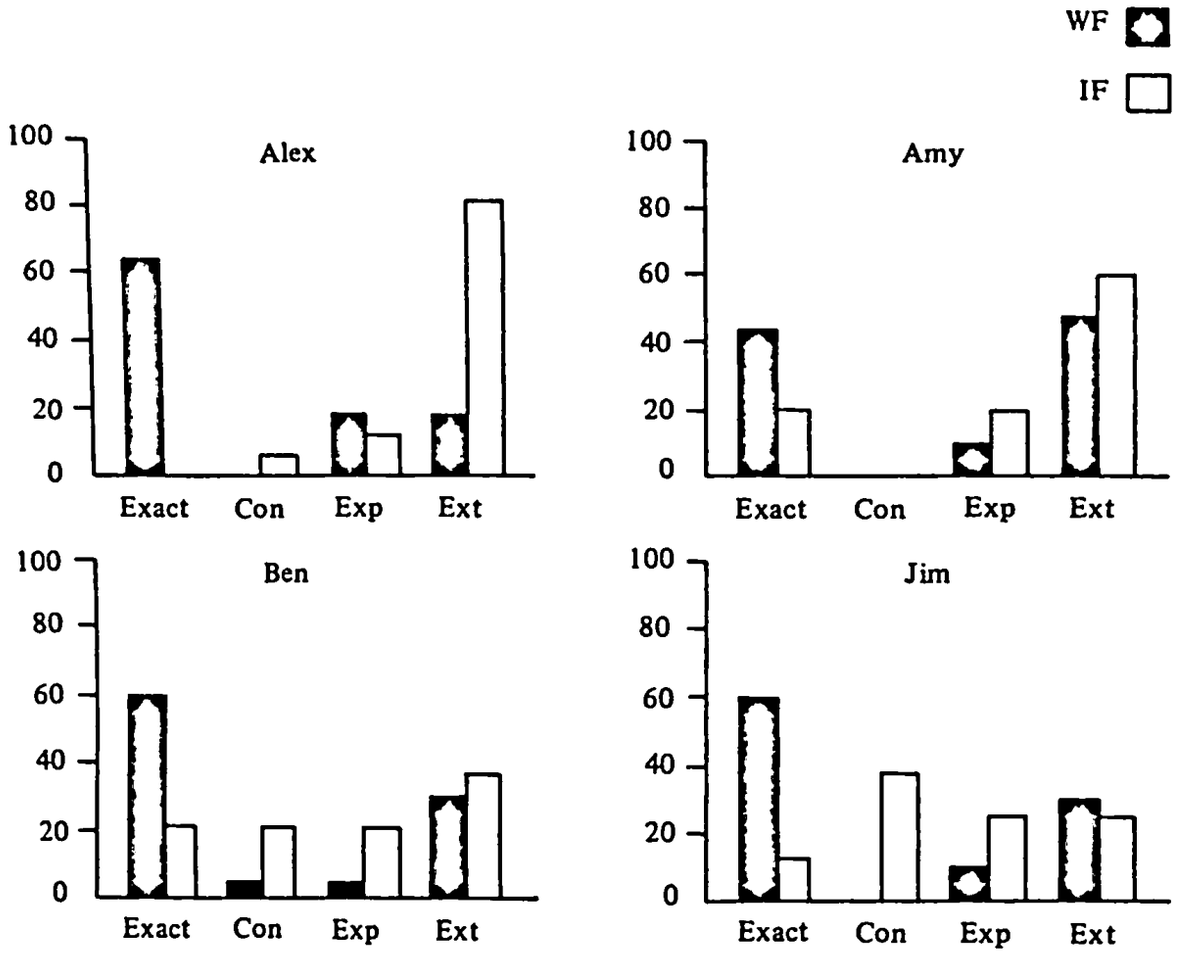

Fig. 2. Percentage of repetitions which followed WF and IF utterances.

A parallel analysis to determine whether mothers' implicit responses were relevant to phonological, syntactic, morphological, semantic or pragmatic errors was attempted. With the exception of phonological errors, a panel of six judges could not reliably attribute responses to semantic, syntactic or pragmatic sources of communicative breakdown. For example, it was clear when a child said *evelator* for *elevator* that the error was a phonological one. However, in the following example, the reason for the mother's failure to understand is ambiguous:

Ben: hat/ Mother: She has a hat on?

Ben's mother might have been having trouble understanding the communicative intent of the child's utterance, the semantic content of the word, or the syntactic role the word was meant to assume. This analysis, suggested by the Brown & Hanlon findings, evidently is not possible without explicit maternal corrections, which aid in pinpointing the nature of the error to which the mother is responding.

Sequences of implicit and explicit feedback

In some cases, implicit feedback was produced immediately prior to explicit

feedback, such that the implicit feedback was adjacent and the explicit feedback non-adjacent to the child's utterance. For example, this type of sequence is shown below (an R followed by an A):

Child:	Mother:
some-by-body took it outside/	
	Somebody took it outside.
	Yeah, it's all gone.

In these cases, the following question was asked: what type of implicit response preceded the explicit response? If a pattern of implicit and explicit sequences was found, the co-occurrence of these two types of feedback might serve to increase the informational value of the maternal response for that turn of the conversation.

The sequences were fairly similar across the four dialogues, so the data were averaged across the four mothers. Rs constituted 69% of the adjacent responses in sequences, CQs 19% and MOs 12%. With one exception, Exact-Rs followed only WF utterances. This type of repetition was not produced in response to IF utterances. IF utterances were followed predominantly by CQs, Ext-Rs and Exp-Rs. This pattern of sequential R responses is similar to the adjacent R responses shown in Fig. 2.

Maternal style

The availability of differential responses was fairly similar across the four mothers. The overall percentage of explicit and implicit responses was relatively the same as reported in Table 2. In addition, in three out of four cases explicit response sequences did not occur, whereas implicit response sequences did. As shown in Table 2, As were the predominant type of explicit feedback, and MOs were the predominant type of implicit feedback.

TABLE 3. *Summary of maternal responses*

	Predominant response (explicit)		Predominant response (implicit)		Child utterance that most often precedes			Predominant repetition		Presence of sequences	
	to WF	to IF	to WF	to IF	MO	CQ	R	to WF	to IF	Exp	Imp
Alex	A	A	MO	CQ	WF	IF	WF	Exact	Ext	Yes	Yes
Amy	A	A	MO	CQ	WF	IF	WF	Exact	Ext	No	Yes
Ben	A	A	MO	CQ	WF	IF	IF	Exact	Ext	No	Yes
Jim	A	A	MO	MO	WF	IF	IF	Exact	Con	No	No

The predominant response for each mother for a majority of the analyses is summarized in Table 3, illustrating a general picture of the pattern of responses produced by each of these mothers to their 2-year-old children.

DISCUSSION

The purpose of the present study was to use an alternative model for investigating the existence of negative feedback in mother–child dialogues. It was our intent to document, if possible, the sources of negative feedback that can be found in the responses mothers provide their 2-year-old children in everyday, casual conversations. It was not the intent to venture into the area of causality – that is, to determine whether maternal input is directly related to the acquisition of language – which has been debated in the literature (cf. Furrow, Nelson & Benedict 1979, Gleitman, Newport & Gleitman 1984, Nelson, Carskaddon & Bonvillian 1973, Snow 1977).

The results indicated that explicit feedback – both positive and negative – was infrequent, directed towards the semantic content of the child's utterances, and not differentially produced in response to WF or IF utterances. In contrast, implicit responses were produced differentially to WF and IF utterances, and the frequency of negative responses (CQs and a majority of Rs) was much greater than that of their explicit counterparts (Cs). It appeared that Exact-Rs functioned similarly to explicit As, confirming the child's preceding WF utterance(s); whereas Ext-Rs and Con-Rs provided corrective information to the child as they more often followed IF utterances. Furthermore, the style of response was similar across most analyses for all four mothers. Our conclusions are, of course, limited by the small, homogeneous sample, and need to be confirmed with larger samples and other groups of mother–child dyads. However, the consistency of the responses across the four mothers suggests that implicit negative and positive feedback does exist for these homogeneous dyads, and is produced differentially to WF and to IF utterances such that children could rely on it as a basis for adjusting or confirming their rules.

If we assume that children produce their utterances with an intent to communicate, and therefore interpret a failure or postponement of uptake as negative feedback, our results and those of many others (Cherry, in press, Garvey 1979, Olsen-Fulero 1982) demonstrate that a high proportion of maternal responses qualify as negative feedback. Our results indicate, furthermore, that these negative responses are more likely to follow IF than WF child utterances. Thus the axiom of learnability theory – that the model of the learner must be powerful enough to operate without negative feedback – seems ill founded. The child does have available information that would help to identify IF utterances in his or her own output.

Judging from our results, however, this information is of less than optimal utility. Ideally, all IF child utterances would receive CQs, and all WF ones MOs. In fact, we find only a proportional differentiation, not an absolute one. Furthermore, the lack of specificity within response categories that prevented judges from determining the source of communicative breakdown (illustrated

above) presents similar problems for the child attempting to interpret the linguistic input. Is it possible that children could make use of a response system as noisy as this one?

First of all, it is clear that children can learn linguistic regularities that are only statistical, not categorical. For example, one hypothesis concerning how children learn to distinguish nouns from verbs proposes some mechanism for checking off co-occurrences of nouns and verbs with their distinctive morphological markers (plurals and articles for nouns; auxiliaries, *-ed* and *-ing* for verbs). This process works to generate two distinct classes, despite the fact that neither nouns nor verbs co-occur with their markers all the time, and that both frequently co-occur with the same marker (e.g. final *-s*) (Maratsos & Chalkley 1981). Thus the process must be working in a frequency-sensitive rather than a categorical way.

Secondly, it is entirely possible that the value of some instances of negative feedback is much greater than that of other instances. For example, occurrence of negative feedback following an IF utterance is powerful in changing the child's linguistic system only if the IF utterance represents a structure the child is actively acquiring, but may be irrelevant otherwise. Utterances produced on the basis of imitation, utterances which incorporate memorized chunks, and utterances which are far more complex than the majority of the child's utterances may be outside the child's current zone of linguistic development. Thus, negative feedback to such utterances may not help the child to modify his rule system in any case. But feedback to IF utterances within the child's current linguistic problem-space (Karmiloff-Smith 1979) would help to (re)formulate a rule and (re)organize the grammatical system. Testing this hypothesis would involve undertaking a much more detailed analysis of negative feedback as related to the child's developing grammar than is presented here (one, in fact, more similar to that used by Brown & Hanlon, 1970, in which responses to child utterances displaying different grammatical rules were assessed separately). None the less, the plausibility of this hypothesis urges at least a much greater attention to adult responses in analyses of children's grammatical development.

It is clear that the failure of occurrence of negative feedback to some IF utterances presents a serious problem to the child only if it is assumed that the child is working on acquiring the entire grammatical system at once, and that every instance of positive feedback will confirm the rule the preceding child utterance instantiates. If the child is indeed working on different problems at different times, then some confirmations of IF utterances may not constitute a serious source of noise in the feedback system.

A more disruptive source of noise in the feedback data is occasioned by the occurrence of negative feedback to WF utterances, something which all the children experienced with some frequency. Clearly, if children start revising their correct rules because of such negative feedback, the process of language

acquisition would become intolerably difficult. Again, a more detailed analysis of the negative responses (Ext-Rs, Exp-Rs, Con-Rs and CQs) to WF utterances is necessary before any clear understanding of the effect these might have on the child's system can emerge. Their occurrence suggests, however, that children may be treating the negative feedback somewhat cautiously, i.e. waiting for more than one instance of negative feedback for a particular structure before altering the associated rule.

Evaluation of the effectiveness of negative feedback in promoting language development will require both correlational data relating availability of differential feedback to speed of language acquisition and experimental data based on manipulating the occurrence of negative and positive feedback. It is striking that there is a perfect correlation in our sample between the child's language precocity at 2;0 and the mother's avoidance of CQs in response to WF utterances, the response which we suggest would be the most confusing to the child. Alex, whose mother very rarely questioned WF utterances, was the most advanced, whereas Amy, whose mother did so 28% of the time, was considerably more delayed. Evaluation of this finding, however, awaits confirmation on a much larger sample.

Our findings accord with those of both Brown & Hanlon (1970) and Hirsh-Pasek *et al.* (1984) in finding that explicit feedback is infrequent and relevant to content rather than form. Our results also partially support Hirsh-Pasek *et al.*'s finding regarding repetition, although our findings suggest that their analysis was incomplete. Furthermore, that repetition responses may be both positive and negative, depending on the type of repetition, agrees with Moerk's analysis (1983*b*) of imitations. Taken together with the findings from Hirsh-Pasek *et al.* and Moerk, our results suggest strongly that the question of negative feedback to children's IF utterances should not have been closed after Brown & Hanon's (1970) study.

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APPENDIX

Instructions for coding of transcripts

CHILD UTTERANCES

Child utterances may be well formed (WF), ill formed (IF) or other (O). Within the WF and IF categories, the utterances may be either a single-word (S) or multi-word (M) utterance. Within the O category, the utterance may be coded as a vocalization (V), laugh (L) or unintelligible (U). The specific guidelines for coding an utterance as one of the above are as follows:

Well formed (WF)

(1) Must be semantically, syntactically, and phonologically appropriate for the context in which it is spoken.
   (*a*) Diminutive endings are allowed: dog*gie*/ hors*ey*/
   (*b*) Directives are allowed: *put it in*/ *push it*/
   (*c*) Single words that call attention to an object, person, or location are allowed: *Ball*/ *mommy*/ *here*/
(2) Prosodic variables (e.g. stress) were not analysed.
(3) Interjections and normal disfluencies (e.g. repetitions of initial words and slight prolongations of vowels) are ignored.

Ill formed (IF)

(1) Morphological errors:
   (*a*) Lack of an obligatory grammatical marker: *he not walking*/

(*b*) Lack of an article in response to a question:
Mother: *What's that?* Child: *doggie/*
(*c*) Inaccurate or incomplete verb forms: *I throwed it/ he no like it/*

(2) Syntactical errors:
(*a*) Incorrect order of morphemes or words: *what he's doing?/*

(3) Lexical errors:
(*a*) Substitution of a non-word for a real word: *bollage* for *collage*
(*b*) Combination of vocalizations and meaningful words in a single utterance if vocalizations do not have a known referent to the listener: *ba ba boo down/*
(*c*) Combination of unintelligible speech and ill-formed speech: *where my* (U)*?/*
(*d*) Violation of semantic selection restrictions: *big money/*

(4) Phonological errors: *evelator* for *elevator.*

(5) Pragmatic errors:
(*a*) The beginning of an incomplete thought: *that is —/*
(*b*) The initial portion of a self-corrected utterance:
I need s/c *I lost my shoes/*

Other (O)

(1) Vocalizations with no meaningful words.
(2) Laughter – must be clear from context, otherwise scored as a vocalization.
(3) Unintelligible utterances – either from the mother's perspective or the transcribers' (in some cases, the audiorecordings are difficult to understand): *I want* (U)/ (U) *bubbles/ where's* (U) *doggie?/*

If an utterance contains words or a sequence of words that are clearly ill formed, then the utterance is coded as IF and not O.

ADULT RESPONSES

Responses are coded as explicit feedback (approval (A) or correction (C)) and/or implicit feedback (repetition (R), clarification question (CQ) or a 'move-on' (MO)).

Explicit responses

Approval/Correction (A/C). These utterances are explicit responses to the child's preceding utterance that either approve or give negative feedback to the child. Words such as *yes, no, that's right,* signal explicit feedback.

(1) The A/Cs refer only to the child's speech, not to behaviour.
Child: *doggie/* Mother: *Doggie, that's right.*
This response is scored as an approval.

(2) A response of *yes* or *no* to a child's question is not scored as explicit feedback.

Child: *climb up?/* Mother: *Yes, you can climb up.*
This response is not scored as explicit feedback.
The context is used to judge whether the response is explicit A/C or an implicit MO.

(3) All words signifying affirmation are scored as an A if the phrase *that's right* can be inserted afterwards. Words such as *Yeah*, which are judged to be conversation fillers, are not scored as explicit approval.
(4) Correction (C), similar to approval, must be explicit – *no* (*that's not right*).
(5) Direct contradiction of a child's preceding utterance is scored as a C.
Child: *orange/* Mother: *That's an apple.*
(6) The mother's repetition of *yes* or *yeah* is scored as a repetition (R), not approval.

Implicit responses

For implicit feedback, the intent is to separate those utterances that continue the topic or initiate new topics (MOs) from those utterances that restate what the child said or ask for additional information (Rs and CQs).

Repetitions (R). Four types of repetitions are coded: exact, contracted, expanded and extended. The use of deictic forms (e.g. substitution of *you* for *me*, *come* for *go*) are accepted as repetitions.

Exact. Exact repetition of what the child said.
Child: *bang/* Mother: *Bang.*
Contracted. Shortening of the child's utterance in any way.
Child: *that is a monster/* Mother: *That's a monster.*
Expanded. Correction of the child's utterance with appropriate syntax or morphology.
Child: *daddy house/* Mother: *Daddy's house.*
Child: *baby sleeping/* Mother: *Baby is sleeping.*
Extended. Repetition of the child's utterance with new information added.
Child: *firetruck/* Mother: *That's your new firetruck.*

Clarification questions (CQ). These responses refer directly to the child's preceding utterance. Questions that start a new topic are not included. Also, any questions requesting knowledge from the child are not included. The different types of questions are as follows:

Wh-. Must start with a wh- word and clarify, otherwise scored as an MO.
Occasional. Questions that have a wh- word embedded in them: *You went where?*
Repetition questions. These are repetitions (as described above) that have a rising intonation contour at the end of the sentence.

Child: *ball/* Mother: *Ball?*
Child: *this my house/* Mother: *This is your house?*

Yes/No. Scored only if no other choice (usually a repetition question can be scored as both a repetition and Y/N. In these cases, the response is scored as a repetition.)

Child: *doggie go/* Mother: *Did you take the doggie with you?*

Tags. If the question is a tag, the utterance is marked in the appropriate repetition question box on the coding sheet with a T.

Child: *Elevator/* Mother: *It's an elevator, isn't it?*

If the child's utterance is a question, and the response is a repetition of that question, the response is scored as a repetition, and not a repetition question.

Child: *What's that?/* Mother: *What's that?*

Move-ons (MO). In these utterances the mother uses the same topic, or starts a new topic, but does not 'negotiate' with the child for meaning. We infer that the mother understands what the child said, accepts it, and moves on with the conversation. Occasionally, an utterance is coded with 'Exc' for exclamation.

Child: *firetruck/* Mother: *There it goes.*
Child: *put that there/* Mother: *Okay, here's one for you.*

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Twin talk: manifestations of twin status in the speech of toddlers*

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ABSTRACT

With the expectation that an examination of language between toddler twins in their home environment would reveal characteristics unique to the subjects' twin status, 31 hours of crib-talk between identical twin girls and diary records of their speech were examined. It was found that the subjects developed conventional syntax and vocabulary, but adapted them in ways which appropriately expressed their twin status. Three salient examples include their use of a double name for themselves as a team, their use of singular verbs in reference to themselves together, and their use of the singular pronoun *me* in pronominal reference to themselves as a team.

INTRODUCTION

One of the least studied and perhaps most interesting areas in the developmental literature is the acquisition of language in the special setting that twinship provides. Research involving twin development generally has had as its immediate aim not the study of twins *per se*, but the resolution of the nature–nurture controversy. Since each set of twins reared together has either identical (monozygotic) or only partially similar (dizygotic) genetic make-up yet shares an identical environment, researchers have used the 'twin method' to determine the relative contributions of heredity and environment to intelligence. Even in the area of language development, twin research has generally focussed not on the special twin context, but on the comparative

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[*] A preliminary version of this paper was presented by the first author at the Sixth Annual Meeting of the Berkeley Linguistics Society, 1980. Material which is similar is used here with permission of the Berkeley Linguistics Society. Address for correspondence: Marilyn N. Silva, Department of Human Development, California State University, Hayward, CA 94542, USA.