NOTES FOR CONTRIBUTORS

Papers, notes and reviews should be sent to Prof. D. Crystal, Department of Linguistic Science, University of Reading, Whiteknights, Reading, Berkshire, England. They should normally be written in English. Major articles should not exceed twenty printed pages.

Three copies of the typescript should be submitted, one of which should be the top copy. Contributions should be clearly typed with double spacing, on one side of the paper only, using a conventional size of paper, preferably A4 (or 21·6 by 28 cm). Authors should hold one copy for correction of proofs. Footnotes, which should be as few as possible, should be listed, double spaced, on a separate sheet at the end of the article. Line diagrams, which should also be kept to a minimum, may be left in the text, but should be numbered independently of examples or utterances, etc. The title-page should include the title, author's name and affiliation, together with the address to which proofs are to be sent. Titles should be so worded that the first part may be used as a running headline (with a maximum length of 50 characters, including spaces). An abstract of the article (max. 120 words) should be typed on a separate sheet. Chronological age should be stated in years, months and (where needed) days as follows: 4;5.17.

Cited forms should be underlined to represent italicization in print. Translational 'meanings' should be placed within single quotation marks. Emphasis should be marked by the use of small capitals. Phonetic transcriptions should, wherever possible, employ the symbols and conventions of the IPA; they must never be used in footnotes, and should in no case be narrower than absolutely necessary for the purpose.

References are to be made in the text thus: (Neisser 1967: 222). If the author's name is part of the text, the following form should be used: 'Piaget (1967: 131) investigates...'. When a work written by three or more authors is referred to, all names should be given in the first citation, with an ampersand linking the last two, e.g. (Fraser, Bellugi & Brown 1963): in subsequent citations the first name only should be given, with '*et al.*' added.

All works referred to should be listed at the end of the article, double-spaced and in alphabetical order. The titles of articles should as far as possible be abbreviated according to the conventions of the Linguistic Bibliography of the Permanent International Committee of Linguists (CIPL). Examples of references (note the use of punctuation marks within references):

Carroll, J. B. (1961). Language development in children. In S. Saporta (ed.), *Psycholinguistics: a book of readings*. New York: Holt, Rinehart & Winston.

Lenneberg, E. H. (1967). *Biological foundations of language*. New York: Wiley.

Oldfield, R. C. & Marshall, J. C. (eds) (1968). *Language*. Harmondsworth: Penguin.

Velten, H. V. (1943). The growth of phonemic and lexical patterns in infant language. *Lg* **19**. 281–92.

Drawings, graphs, tables and figures should be done to professional standards in Indian ink on heavy unruled paper, or on graph paper ruled in light blue. Lettering on graphs, etc., is to be indicated in blue pencil or (preferably) on an overlying sheet of tracing paper.

With the exception of the title-page, book reviews should be submitted in the same form as articles. The title-page should be of the following form:

F. Smith & G. A. Miller (eds), *The genesis of language*. Cambridge, Mass.: MIT Press, 1966. Pp. xii + 400.

Reviewed by ROGER J. WALES,
Psychology Department,
University of Edinburgh.

J. Child Lang. **5**, 1–15. Printed in Great Britain

The achievement and antecedents of labelling*

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ABSTRACT

The achievement of labelling was investigated in a longitudinal study of one mother–infant dyad, using video-recordings of their free play in a period between 0;8 and 1;6. Analysis of joint picture-book reading revealed that this activity had very early on the structure of a dialogue. The child's lexical labels might be regarded as more adult-like substitutes for earlier communicative forms that he had utilized in the dialogue. These were smiling, reaching, pointing and babbling vocalizations, all of which were consistently interpreted by the mother as expressing the child's intention of requesting a label or providing one. Participating in a ritualized dialogue, rather than imitation, was found to be the major mechanism through which labelling was achieved.

INTRODUCTION

One of the first uses a child makes of his emerging language is to NAME people and objects (Greenfield & Smith 1976, Leopold 1949, Werner & Kaplan 1963, Atkinson 1974). Nominals comprise up to 64% of a child's 50-word vocabulary (Nelson 1973), while in terms of frequency of occurrence in his speech they appear in the majority of utterances in the first months of speech production (Greenfield & Smith 1976). Analyses of the contexts in which naming occurs indicate that a substantial amount of it occurs without a discernible utilitarian purpose, such as a demand for an object. The child appears to name objects and people for the sake of naming itself, and seems, moreover, to take great delight in doing so.

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A number of investigators, puzzled by the apparent sophistication displayed in the early use of nominals, have questioned whether the function of early nominals is the same as that of adult naming, i.e. informing another that an object has a specified name. Atkinson (1974) has pointed out that early naming is stimulus-bound and fulfils principally an attention-getting or attention-directing function; whilst Halliday (1975) regards naming either as 'interactional' (i.e. a means of getting another's attention), or as 'practice' (all examples of which he excluded from the language-corpus analysed in his book). Bruner (1975), following Harrison (1972), has suggested that it is a technique for bringing another's attention to one of a set of alternative environmental objects or events. Brown (1973) pointed out that early nomination occurs in a setting where it serves either to call attention to the presence of a referent or to demonstrate that the child is able to match the name and referent, e.g. a teaching–learning situation.

An added perspective is offered by Werner & Kaplan (1963). These authors propose that reference emerges as a concomitant to a new mode of treating the world, as 'objects-of-contemplation' rather than 'things-of-action'. But Werner & Kaplan offer no explanation for the shift to the contemplative attitude, apart from the general psychodynamic development of the child which enables him at this age gradually to 'separate' himself more from the world. In their view, the mother's role in the emergent new behavioural pattern is solely to provide the interpersonal context in which the child 'shares' his experiences with her, rather than 'communicating' messages to her (1963: 79).

The present paper reports the results of a longitudinal study of a single mother–infant pair in the process of mastering the use of standard lexical labels from the eighth to the eighteenth month of the infant's life.

The fashionable assertion that language is learned but not taught, a hyperbole nurtured by a decade of 'strong' nativism in the 1960s, is nowhere less true than in the child's acquisition of a lexicon. Indeed, there is some reason to believe (Nelson 1973, Lieven in the Press, Cromer in the Press) that there is more than one form of pedagogy among mothers and possibly several routes to acquisition.

At the outset of any bout of language acquisition – whether it be pointing or labelling or making comments on shared topics – the mother has possession of a skill that the child either lacks completely or 'has' only in some primitive sense, as when he has mastered pointing but is unable to use labelling as a linguistic device. It is almost invariably the case, as Snow (1976) reminds us, that the child, for all his ineptness, is SEEN by the mother as having the intention to carry out the function that will later be realized by the linguistic form she is trying to teach him. As Ryan (1974) proposed, the mother's pedagogy might consist of supplying the appropriate form to what she guesses the child is intending to express. In consequence, as Holzman suggested (1972: 312), 'the child finds out by the responses of adults what he is assumed to mean by what he is saying'.

All this contributes to the construction of a kind of 'scaffolding dialogue' between mother and child. The origin of this dialogue obviously precedes the emergence of labelling. Indeed, it now appears as if even the earlier exchanges between mother and infant have about them a contingent pattern, with the mother responding selectively and even imitatively to the child's gesturing and vocalization, the child then responding to the mother's response. Trevarthen's work (e.g. 1974) certainly suggests this early origin, as do the precise studies by Daniel Stern (1975) on turn-taking in early vocal and gestural exchanges. In time, the dialogue increases in complexity and serves as a 'carrier wave' for new communicative functions – for signalling and responding to demands, for directing attention, and so on.

In the study to which we turn now, we have used book-reading as a principal source of data – the mother and child looking at pictures in a book. We have chosen to concentrate on book-reading since it appeared to be the major activity in which labelling occurred. Moreover, we were particularly eager to study the continuity between labelling and earlier forms of ostension, e.g. pure pointing. When Richard, our subject, first achieved pure pointing for indicating objects (at around 0; 10) it was most likely to occur with a referent that could not be manipulated (Bruner, Caudill & Ninio in the Press). Many of these referents were pictures in picture-books. This continuity of contexts seemed to be more than a coincidence and thus justified a closer investigation.

METHOD AND PROCEDURE

The data were drawn, as noted, from a longitudinal study of one mother–infant dyad between 0; 8 and 1; 6. The child was a first-born only child. His parents were white, English, and middle-class, the mother having worked as a secretary before the child was born. The father was a schoolmaster.

Video-recorded observations were made in the home at two- to three-weekly intervals. Each session consisted of thirty minutes of normal play, routinely engaged in by mother and child. Two experimenters were present in these sessions, one filming. Most sessions were also audiotaped. Book-reading occurred in the natural course of play and no special instructions were given about it.

The data tapes, marked in real time, were analysed with a stopped-frame Sanyo VTR. All book-reading sessions were analysed. Such sessions were defined as those interactions between mother and child which involved initiating, maintaining, executing and stopping joint looking at picture-books. In all, twelve filming sessions contained incidents of book-reading, the first of these at 0; 8.

Video data were first transcribed into a written protocol, note being taken of the duration of various behaviours. The following behaviours were recorded. For the mother:

(1) the full content of all verbal utterances;

(2) the occurrence of pointing to a picture;
(3) laughing.

For the child:

(1) the occurrence of all vocalizations, with the following additional information:

(a) the content of obviously articulated or word-like vocalizations (i.e. possible lexical items);

(b) the apparent functional category of all other vocalizations, i.e. excitement, demand, fretting and book-reading, the last a 'basket' category for every vocalization not categorized as excitement, demand or fretting;

(2) gestures (towards the book), in the following categories: mouthing, manipulating, hitting, touching, reaching, scratching, pointing;

(3) smiling;

(4) direction of gaze: to book, to mother, to the experimenter, at other parts of the room, searching for specified objects in the room.

Transcribing was performed jointly by two recorders. In the event of disagreement a decision was arrived at by asking for a third opinion.

Examination of the timing of mother's and child's behaviours indicated an almost complete alternation pattern, i.e. the two participants could be best described as taking turns in a conversation or dialogue. The next step in data analysis was, then, to identify discrete dialogue cycles (Stern 1975, Garvey 1974) in the continuous stream of mother–child interaction. Only cycles of book-reading were analysed in this way.

A. The ONSET of a reading cycle was defined as occurring if:

(i) a book was open to a picture, within easy sight, AND

(ii) mother OR child were paying attention to a picture and were pointing, gesturing, vocalizing in a fashion directed to the contents of the book. This excluded passive gazing at a book, calling for a book at a distance, simply turning pages without looking, etc.

B. The OFFSET of a reading cycle was defined as occurring when either of the following occurred:

(i) the book ceased being open to a picture within sight;

(ii) a new picture was introduced, i.e. the onset of a new cycle;

(iii) the child's attention was withdrawn from the picture as shown by lapse into manipulation of the book, leaving the scene, fretting, etc. A gaze at adults was not considered to end a reading cycle unless the child did not return to the picture within a few seconds, but lapsed into other activity;

(iv) mother's attention was turned away from book-reading for more than a few seconds.

Concluding turns were excluded from the cycle (e.g. a fretting vocalization of the child's and the mother's response to it).

Discrete TURNS in a reading cycle were defined as follows. Two adjacent vocalizations or gestures by the same person were considered to belong to two different turns of a dialogue cycle if they were separated by a pronounced pause, whether the pauses were filled or unfilled by the other person. A set of such turns constituted a cycle if they met the requirements noted above for onset and offset.

Two independent recorders assigned the recorded behaviour elements to cycles and turns. Inter-rater reliability was 96·4%, which is the percentage of all instances on which the two recorders agreed. All discrepancies were referred back to the videotape recordings and in every case an agreement was reached. In addition, every label uttered by the mother was recorded for nine complete half-hour sessions (from 0; 10 to 1; 6) whether the label occurred in book-reading or not. Labels were defined as the stressed element in a demonstrative utterance, e.g. 'It is (an) X', the X being a stressed nominal, verb or modifier. The referents of these labels were categorized as to their position at the time of labelling – whether they were manipulated by the child, at a distance from him, or were pictorial referents.

RESULTS AND DISCUSSION

To begin with, we may inquire whether labelling occurs in particular contexts – recalling that we had noted earlier that its precursor, pointing, was limited to situations where grasping and manipulation were not present. Pointing, of course, is under the control of the child. Does the mother conform to the same rule? An analysis was made of the circumstances under which Richard's mother labels objects, based on nine full thirty-minute sessions from 0; 9.27 to 1; 5.21. 7·2% of the specified objects were being manipulated by the child as they were labelled; 17·2% were at a distance from him, and 75·6% consisted of a picture. This distancing of objects for labelling probably serves to ensure that the child's attention is free and therefore more easily directed to the names of objects, rather than to their manipulative characteristics.

The choice of pictures as the preferred vehicle for vocabulary teaching is significant by itself. Pictures, being two-dimensional representations of three-dimensional objects, have special visual properties: they can be perceived both as a two-dimensional object AND as representing a three-dimensional visual scene. This poses a conflict for a child, one which he solves increasingly by assigning a privileged, autonomous status to pictures as visual objects. There is steadily less evidence of the child trying to manipulate, grasp or scratch pictured objects on a page. This process might be one of the stepping stones to grasping arbitrary symbolic representation in language, since visual representations are themselves arbitrary in the sense that a crucial object property, i.e. graspability, is missing.

The most striking characteristic of labelling activity is that it takes place in

a structured interactional sequence that has the texture of a dialogue. Here we find ourselves in agreement with Stern (1975) and Snow (1976), both of whom note the early appearance of patterned turn-taking in rule-governed situations involving gestures, eye-contact and vocalizations.

The early forms of 'dialogue' observed in the present study and others conducted along similar lines (Bruner 1975) are mostly thing-orientated and involve the use of a concrete object which serves as the topic of the exchange. This might take the form of a game of give-and-take in which an object is passed from child to mother or from mother to child and back again. This game exhibits the basic characteristics of dialogue, in that it ascribes roles, turn-taking, initiating and responding to another. Once book-reading starts, the child uses his already established skills for dialogue in order to engage in a structured exchange on non-concrete topics. It is not surprising, then, that joint book-reading by mother and child very early and very strongly conforms to the turn-taking structure of conversation. Indeed, turn-taking in book-reading is nearly perfect from the start, only about 1 % of the two participants' phrases occurring simultaneously rather than alternately.

During the investigated period, principally between 0 ; 11 and 1 ; 6, reading dialogue cycles were highly constant on a number of structural characteristics. Mean number of turns per cycle (average of 11 sessions) was 3·9 (s.d. 1·3); mean duration of a cycle was 5·8 seconds (s.d. 2·2) and the mean duration of a turn was 1·49 seconds, (s.d. 0·25). Spearman rank correlations failed to reveal a significant age trend in any of these measures ($r = -0{\cdot}255$, $-0{\cdot}316$ and $-0{\cdot}114$, all $> -0{\cdot}535$, $P > 0{\cdot}05$, 11 d.f., for turns per cycle, time per cycle and time per turn, respectively). These constancies in the dialogue are quite remarkable if one considers that during the same period the child's linguistic performance undergoes profound changes, including the appearance of standard lexical words in his communicative repertoire. In the following we shall attempt to identify some of the factors contributing to these formal constancies, and to assess their significance to the child's acquisition process.

To begin with, the variety of the mother's utterances in book-reading is very limited: she makes repeated use of four key utterance types. These are the ATTENTIONAL VOCATIVE *Look*, the QUERY *What's that?*, the LABEL *It's an X*, and the FEEDBACK UTTERANCE *Yes*. They are illustrated below by an example from the session at 1 ; 1.1.

Mother: Look! (ATTENTIONAL VOCATIVE)
Child: (Touches picture)
M: What are those? (QUERY)
C: (Vocalizes and smiles)
M: Yes, they are rabbits. (FEEDBACK AND LABEL)
C: (Vocalizes, smiles and looks up at mother)
M: (Laughs) Yes, rabbit. (FEEDBACK AND LABEL)

C: (Vocalizes, smiles)
M: Yes (Laughs) (FEEDBACK)

All dialogue cycles defined by our rules (see above) contain at least ONE of these utterance types by the mother, although each type might take some slightly different token form. Table 1 presents the distribution of the tokens found for each major type.

TABLE 1. *Distribution of utterances classified as tokens of the four major types of maternal speech*

	Type/tokens	Frequency
I	Look	65
	Look!	61
	Look at that	4
II	What-question	85
	What's that?	57
	What are those?	8
	What are they doing?	6
	What is it?	5
	What are they?	1
	What's on that page?	1
	What have we got here?	1
	What's the next one?	1
	What's over here?	1
	What else can you see there?	1
	What does that do?	1
	What do you see there?	1
	What can you see?	1
III	Label	216
	X (=a stressed label)	91
	It's a (an) X	34
	That's a (an) X	28
	There is a (an) X	12
	A (an) X	12
	That's X	6
	There is X	6
	Lots of X	5
	They are X-ing...(e.g. going to bed)	5
III (cont.)		
	More X	3
	They are X	3
	These are the X	3
	The X	2
	You can see the X	1
	That one is X	1
	Look at the X	1
	It says: X	1
	We'll call it an X	1
	Kind of X	1
IV	Feedback	80
	Yes	50
	Yes I know	8
	It is not X	5
	That's it!	3
	Isn't it	2
	Not X	2
	No, it's not X	2
	Yes, it is	1
	That's charming	1
	You are right	1
	No, it's an X, not a Y	1
	No, it's an X	1
	Yes, they are	1
	Yes, very good!	1
	That's not an X	1

These key utterances by the mother account for virtually all of her utterances in reading cycles during the whole of the period studied. Moreover, it should be noted that the wording and intonation of these utterances is indistinguishable between the early and the late sessions. The key utterance types have strict privileges of occurrence and ordering. Every book-reading cycle initiated by the mother begins with one of the *Look*, *What's that?* or *It's a (label)* type of sentence. Within a given cycle, the order of these sentences is almost always constant:

Look precedes *What* (in 94·7 % of the cases, $N = 19$, $P < 0{\cdot}001$, binominal test); *Look* precedes a label (in 92·9 % of the cases, $N = 28$, $z = 3{\cdot}97$, $P < 0{\cdot}01$); and *What* precedes a label (94·3 %, $N = 35$, $z = 4{\cdot}73$, $P < 0{\cdot}01$). A feedback type of utterance which either confirms or corrects the child's contribution nearly always occurs in a later position than either *Look* or *What* (92·9 %, $N = 28$, $z = 3{\cdot}97$, $P < 0{\cdot}01$; 97·6 %, $N = 41$, $z = 5{\cdot}78$, $P < 0{\cdot}01$). It always follows a phrase of the child's. Since feedback utterances often occur with label, the position of the two is not ordered, given that sentences like *Yes, it is an X* are common. When feedback and label utterances appear together in a pair of separate sentences, the latter almost invariably follows the former.

These privileges of occurrence suggest that the mother uses the key utterances with due regard to accepted presuppositional structure. That is, *Look* presupposes that the other person is not attending to a shared focus of attention; it is not used once shared attention has been achieved. Conversely, *What's that?* presupposes that the referent of *that* has been established previously. Similarly, the occurrence of labelling after the query, rather than before it, is conventional. In this sense it is important to note that no gross modification of the adult's customary use of language is required to carrying out book-reading. The mother is acting in a linguistically conventional manner.

There are, of course, fundamental differences between adult-to-adult conversation and that of a mother with a small infant. As Trevarthen (1974), Snow (1976) and others have reported, mothers are ready to accept an astonishing variety of responses on the baby's part as his turn in the conversation and to interpret anything he does as having a specific, intelligible content. The imputation of intent and content to the infant's signalling behaviour probably constitutes an important part of the mechanism by which the child is advanced from more primitive to more adult-like communicative behaviours. This mechanism might be at its maximal efficiency when repeatedly and consistently applied in a standard action format (Bruner 1975). These are simple and recurrent joint action patterns (like playing peek-a-boo or putting on a pair of shoes), in which the participants seem to have worked out a mutually clear set of expectations and actions. Since the set of possible 'meanings' in such a format is both restricted and shared, these might provide the referents to which more and more advanced communicative signals are attached.

The book-reading situation has the characteristics of such a standard action format, with the additional qualification that its language-teaching function is more central than in other formats. As we have seen, in its basic form it consists of just three ordered elements (the attentional vocative, the query and the label). It is possible for the mother to go through the three-step routine by herself, with the child providing minimal participation by passively attending to her and to the book. But on the great majority of occasions the child takes his turn in the cycle in a more active way and this provides the mother with a signal which she

then interprets as the child's taking over of one or more of the elements in the labelling routine.

The mother usually responds to the child's turns by a new turn of her own (72·3 %) within the same cycle. This tendency to continue to discuss a particular picture if the child seems to be interested in it undergoes very little change as the child grows older (Spearman rank correlation = $-0{\cdot}49 > -0{\cdot}51$, 12 d.f., n.s.). The mother reciprocated equally to the child's response whether it was vocal or gestural (71·6 % vs. 75·5 % reciprocity, $\chi^2_{(1)} = 1{\cdot}44 < 3{\cdot}84$, $P > 0{\cdot}05$, n.s.). However, the mother was more likely to respond to a turn of the child's if it constituted the initiation of a new dialogue cycle (86·0 %) than if it constituted a reciprocation of a previous maternal turn in an already started dialogue (68·5 %, $\chi^2_{(1)} = 5{\cdot}95 > 3{\cdot}84$, $P < 0{\cdot}05$).

The child's initiating turn, if it is recognized by the mother, is mostly interpreted by her as meaning both *Look!* and *What's that?*: in 78·7 % of the cases she immediately labels the picture that the child is looking at. In the other 12·8 % of the cases she asks a *what*-question, and 8·5 % of the time she utters a reinforcing comment. When the mother is responding to a turn of the child's which is in mid-cycle, the distribution of her responses is different: there are more reinforcing comments (27·5 %), fewer labels (57·3 %), and about the same percentage of *what*-questions (15·2 %, $\chi^2_{(2)} = 7{\cdot}44 > 5{\cdot}99$, $P < 0{\cdot}05$).

Guessing what is 'on the child's mind' is obviously crucial to the teaching of a vocabulary. The use of pictures must surely narrow that guess. Once the mother has some reason to believe that the child knows the object presented in a picture, she can provide a label for it as the most likely candidate for reference. There is, of course, the classical many–many mapping problem of reference, i.e. how to achieve a match between that ATTRIBUTE of the picture the child may be noticing and the attribute singled out by the mother's label. In our dyad, the problem was bluntly but probably effectively managed by the mother's concentrating most of her labelling upon WHOLE objects or WHOLE persons in the picture. Table 2 presents the distribution of the mother's labels according to their referential focus. The words considered as labels were, of course, the Xs in sentences like *It is an X*, *An X*, *See X*, etc. All labels were stressed, sometimes in an exaggerated manner. Each label was counted only once per cycle, even if it was repeated in the cycle several times. In turn, the child used labels that in adult discourse conventionally stand for whole objects, as also indicated in Table 2.

Once mother and child step out of the labelling routine, the range of possible interpretations of the child's focus of attention opens up drastically. When, for example, the mother reads a nursery rhyme aloud and the child vocalizes at the end of a line, there is no simple way for her to guess his intended meaning. Since she wishes to stay in a conversational framework, she responds, but can do so only with a 'contentless' phrase, e.g. *Yes, I know*, *You are right*, *Yes, it is*, etc. In none of the dialogue cycles that started with a rhyme or a procedural comment

of the mother was there ever a reply by the mother to the child's response in th form *Yes, it is a (label)*, while 37·5 % of reading dialogues with a like reinforcin comment contained a label as well in the same turn ($\chi^2_{(1)} = 5{\cdot}47 > 3{\cdot}84$, $P < 0{\cdot}05$). The comparison suggests why book-reading is such an effectiv means of assuring significative convergence between mother and child.

TABLE 2. *Distribution of mother's and child's labels by referential focus*

Type of referent	% of mother's labels	% of child's labels
(1) Common nouns of whole objects	88·9	89·8
(2) Common nouns of parts of objects	2·9	4·1
(3) Proper names	4·1	4·1
(4) Other (actions, attributes etc.)	4·1	2·0
Total %	100·0	100·0
Total number of labels	170	49

Imputation by the mother of reference or of meaning in book-reading seems to be anything but indiscriminate or self-delusory. On the contrary, it seems to be based on a constantly updated, detailed 'inventory' of the child's past exposure to objects and events, of the words he has previously understood, and of the forms of expression he has achieved. The Richard corpus is abundant with evaluative utterances in which the mother expressed (perhaps partly for the experimenter's benefit) the reasons for her expectations that the child would or would not recognize a picture or utter a label. For instance: *You haven't seen one of those; that's a goose. You don't really know what those are, do you, they are mittens; wrong time of year for those. It's a dog; I know you know that one. We'll find you something you know very well. You don't know that one, do you? Come on, you've learned 'bricks'*, etc. It was obviously impossible, despite its desirability, to account for every instance of imputation in terms of the underlying structure of maternal expectations. Nevertheless, it was possible to trace one gross adjustment of the imputing rules according to the child's changing abilities.

Table 3 presents information on changes in the rate and nature of the child's participation in book-reading. An active response includes vocalization, gesture, smile, eye contact with mother and search for a specified object. Active participation, vocalization and lexical utterances all increase steadily. Spearman rank correlation between age and proportion of active cycles was significant ($r = 0{\cdot}740 > 0{\cdot}712$, $P < 0{\cdot}01$), as was the correlation between age and proportion of turns containing a vocalization ($r = 0{\cdot}902 > 0{\cdot}712$, $P < 0{\cdot}01$).

The appearance of vocalizations that were recognizable approximations to lexical labels at 1 ; 2 probably encouraged the mother to believe that the child

now possessed a hypothesis about a relation between sound and meaning. She now began to act as if she believed that the child was capable of producing appropriate words rather than mere babbles. This modification in the mother's 'theory of the child' might explain the changes that now occurred in her 'imputation rules' with respect to the child's gestures and vocalizations. These changes are presented in Table 4.

TABLE 3. *Proportion of reading cycles in which the child emitted an active response, proportion of active turns of the child's containing a vocalization, and proportion of vocalizations which were lexical labels, by age*

Age	Number of reading cycles	% of cycles in which child emitted at least one active response	Number of active turns by the child	% of active turns containing a vocalization	% of vocalizations which are lexical labels
0 ; 8.14	2	50·0	4	0·0	0·0
0 ; 11.7	9	55·6	17	35·3	0·0
1 ; 0.25	7	71·4	10	90·0	0·0
1 ; 1.7	6	83·3	13	76·9	0·0
1 ; 1.22	40	37·5	17	41·2	0·0
1 ; 2.7	26	43·8	18	38·9	28·6
1 ; 3.13	36	86·1	60	93·3	50·0
1 ; 3.21	18	88·9	22	95·4	61·9
1 ; 4.14	35	77·1	50	92·0	54·3
1 ; 5.8	19	84·2	32	100·0	28·1
1 ; 5.22	4	100·0	5	100·0	20·0
1 ; 6.1	7	100·0	12	100·0	50·0

Table 4 shows that, to begin with, the mother is ready to accept her child's lexical vocalizations as labels, never in twenty opportunities challenging him with *What's that?* after such an utterance. But more interesting still, she is, after the first appearance of lexical-like utterances, treating his babbling in a new way. Whereas before she responded by treating such utterances as if they were ATTEMPTS at labelling, confirming them and supplying a correct label, now she demands that he do better by responding with a *What's that?* query. The difference in response to such vocalizations before and after the turning point is highly significant ($z = 3{\cdot}84 > 2{\cdot}32$, $P < 0{\cdot}01$). Note that the child's capacity to generate phonologically well-formed labels does not change her interpretation of his gestures: they are still treated as calling attention to an item and provoke about the same frequency of *What's that?* queries before and after 1 ; 2. Such non-vocal behaviour never falls into the category of labelling: it is treated by the mother as indicating demand for a label, with the mother insisting on the child's trying to provide it himself. Looking at these phenomena from a broader point of view, it is possible to regard the mother as coaxing the child to substitute,

first, a vocalization for a non-vocal signal and later a well-formed word or word approximation for a babbled vocalization, using appropriate turns in the labelling routine to make her demands.

The book-reading dialogue seems, as we have noted, to be a format well suited to the teaching of labelling. It has few elements and strict ordering rules between them. It is flexible in the sense of accepting a great variety of responses by the child. It is highly repetitive. Not only do the fixed elements (*Look*

TABLE 4. *Mother's response to the child's gestures, vocalizations and labels, before and after occurrence of first lexical labelling by the child*

Mother's response	Child's action: Before labelling (0; 8.14–1; 1.22)	Child's action: After onset of labelling (1; 2.7–1; 6.1)	Total
A. Non-vocal gesture			
Yes, it is an X[a]	3	1	4
What's that?	6	9	15
Total	9	10	19
B. Non-lexical vocalization			
Yes, it is an X[a]	6	3	9
What's that?	0	17	17
Total	6	20	26
C. Lexical vocalization			
Yes, it is an X[a]	0	20	20
What's that?	0	0	0
Total	0	0	20

[a] Including 'No, it is not an X'.

What's that and *It's a* (*label*)) appear over and over again, with minimal changes in the wording, but the variable elements, the labels themselves, appear repeatedly as well. Disregarding repetitions within cycles, the mean recurrence rate of specific labels was 2·4 (s.d. 2·3), namely each label appeared in a mean of 2·4 different cycles, the maximum recurrence being 15 cycles for one label. And since our mother–child pair engaged in joint book-reading outside the recorded half-hour sessions as well, using the same limited set of children's books, the true recurrence rate is probably very high indeed.

Another effective characteristic of the reading dialogue as a teaching device was its close-coupled feedback system. Once the child could produce easily recognizable words, the mother could and did respond to most of them quickly

and appropriately. All eleven incorrect labels offered by the child were corrected by the mother. Corrections contained the following information:

Negation of child's label (e.g. *It is not a flower*): 2 cases.
Offer of correct label (e.g. *It is a dog*): 3 cases.
Both (e.g. *It is not a flower, it is a dog*): 6 cases.

The corrections seem to have had an immediately ensuing behaviour effect, since only once in eleven opportunities did the child REPEAT a label that had been corrected, in the same cycle.

In all, the mother reinforced 81 % of the child's 'correct' labels at least once in the cycle in which they appeared. Positive feedback consisted of three elements, singly and in combination: (*a*) idealized imitation of the child's label; (*b*) *Yes*; and (*c*) laughter. These three formed a Guttman scale (in the above stated order),[1] which accounted for 81 % of all observed combinations. The second best alternative scale order is *Yes* – imitation of labels – laughter, which accounted for only 50 % of the combinations. Imitation was the most common response, occurring in 24 out of 31 (77·5 %) of all instances of feedback.

Lest it should seem that the high incidence of imitation by the mother is the principal factor leading the child to utter labelling responses, the two following cautions should be stated. The first is that the likelihood of the child immediately REPEATING a label is not affected by the NATURE of the mother's positive feedback. The rate of repeating a label is 45·8 % following the mother's imitation of it, but it is 42·9 % following laughter or her merely saying *Yes*. Moreover, in the absence of ANY overt positive response, the child repeats the label 40·0 % of the time. This suggests that it is not so much imitation as the dialogue structure and its reciprocity that is reinforcing the child. In all, a non-negative response leads to a repetition of the label in 43·9 % of instances, but a negative response (combining the three types mentioned earlier) suppresses repetition to 9 % ($z = 2{\cdot}21 > 1{\cdot}65$, $P < 0{\cdot}05$).

There has been a claim in the literature (Nelson 1973) that correction causes words to disappear from the child's working vocabulary. To test this claim, we traced the later fate of words involved in a mismatch, and of words correctly applied. The latter reappeared in 60 % of the cases, 83 % of them correctly used. Misapplied labels, all of which were corrected by the mother, reappeared in 87·5 % of the cases, of these 85 % correctly applied. Although those words which the child SHOULD have uttered (but for which he substituted a wrong label) appeared later in the corpus only 25 % of the time, all were used correctly. The difference in the fate of correctly and incorrectly USED words is not significant ($z = 1{\cdot}41 < 1{\cdot}96$), the trend in any case being in favour of the misapplied

[1] A perfect Guttman scale of these elements in this order would mean that *Yes* appeared only if imitation did, but not vice versa; and that laughter appeared only if *Yes* did, but not vice versa.

words recurring more often. Correcting a misapplied word not only does n suppress its reappearance, it may increase its chances of being used again.

Does imitation play any notable part in the acquisition process at all? Do the child learn labels by immediate imitation? Take the probability of the chi uttering a recognizable label. That probability is very dependent on the type utterance that opened the cycle in which it occurs ($\chi^2_{(3)} = 12{\cdot}48 > 11{\cdot}3$, $P < 0{\cdot}01$). It is greater if the cycle is initiated by the child (0·49) or by t mother uttering a *What's that?* question (0·37), than if it is initiated by the moth saying *Look* or offering a label (0·20 and 0·10). *What*-questions, moreove usually elicited a label from the child without further explicit promptin 93·3 % of the labels given in response to the mother's *What's that?* initiat cycles occurred before the mother offered a label in the cycle. In child-initiat cycles the same was true of 73·1 % of the labels.

It would seem then that providing the child with a model to imitate actual depresses the probability that he will utter that word immediately, but if t mother provides the correct conversational setting for labelling (by asking *Wha* questions or letting the child initiate) it is more likely that the child will lab on his own. On the other hand, there is reason to believe that the mother START a cycle with a label ONLY if she thinks that the child will not label the pictu himself, either because he does not yet know the correct word, or because he not attentive enough to make the effort at labelling. If circumstances seem mo favourable for labelling to occur, she will usually start the cycle with a *What that?* question. Some evidence for such a difference between cycles initiat by a label and by a *what*-question comes from an analysis of labels occurring such cycles. The two contain different words and different target objects to b labelled. Testing for co-occurrence of words in the two types of cycles, we fi such co-occurrence is significantly less than would be expected by chan ($\chi^2_{(1)} = 8{\cdot}66 > 6{\cdot}64$, $P < 0{\cdot}01$). But cycles initiated by the child tended to ha the same words in them as those initiated by the mother's *What's tha* ($\chi^2_{(1)} = 1{\cdot}83 < 2{\cdot}71$, $P > 0{\cdot}05$, trend for positive association) and differed fro the label-initiated ones ($\chi^2_{(1)} = 8{\cdot}06 > 6{\cdot}64$, $P < 0{\cdot}01$). The two classes words could be categorized as the familiar-easy ones and the unfamiliar-ha ones, the latter being reserved by the mother for initial labelling. By adjustin her stimulus to the probability of the child's emission of a response, the moth helps the child to acquire a fundamental language skill: differential respon rate to questions and statements.

CONCLUSION

One can properly conclude, we believe, that a central element in the achievemen of labelling by the child is his mastery of the reciprocal dialogue rules that gover the exchanges between him and his mother into which labelling is inserte

Reference, then, is dependent not only upon mastering a relationship between sign and significate, but upon an understanding of social rules for achieving dialogue in which that relationship can be realized.

REFERENCES

Atkinson, R. M. (1974). Pre-requisites for reference. Paper presented at B.A.A.L. Seminar on Applications of Linguistics to Language Development. University of Newcastle-upon-Tyne, April.

Brown, R. (1973). *A first language: the early stages*. Cambridge, Mass.: Harvard University Press.

Bruner, J. S. (1975). The ontogenesis of speech acts. *JChLang* **2**. 1–19.

Bruner, J. S., Caudill, E. & Ninio, A. (in the Press). *Language and experience*. London: Routledge & Kegan Paul.

Cromer, R. F. (in the Press). Developmental strategies for language. In V. Hamilton & M. D. Vernon (eds), *The development of cognitive processes*. London & New York: Academic Press.

Garvey, C. (1974). Interaction structures in social play. Paper presented at the New Orleans Symposium on Current Research in Children's Play.

Greenfield, P. M. & Smith, J. H. (1976). *The structure of communication in early language development*. New York: Academic Press.

Halliday, M. A. K. (1975). *Learning how to mean – explorations in the development of language*. London: Edward Arnold.

Harrison, B. (1972). *Meaning and structure*. New York & London: Harper & Row.

Holzman, M. (1972). The use of interrogative forms in the verbal interaction of three mothers and their children. *JPsycholingRes* **1**. 311–36.

Leopold, W. F. (1949). *Speech development of a bilingual child: a linguist's record. III, Grammar and general problems in the first two years*. Evanston, Ill.: Northwestern University Press.

Lieven, E. (in the Press). Conversations between mothers and young children: individual differences and their implications for the study of language learning. In N. Waterson & C. Snow (eds), *The development of communication: social and pragmatic factors in language acquisition*. London: Wiley.

Nelson, K. (1973). Structure and strategy in learning to talk. *Monogr. Soc. Res. Ch. Devel.* **38**, nos. 1–2, serial no. 149.

Ryan, J. (1974). Early language development: towards a communicational analysis. In M. Richards (ed.), *The integration of a child into a social world*. London: C.U.P.

Snow, C. E. (1976). The development of conversation between mothers and babies. *Pragmatics Microfiche* **1.6**, A2.

Stern, D. (1975). The infant's stimulus 'world' during social interaction. Paper presented at the Loch Lomond Symposium, University of Strathclyde, September.

Trevarthen, C. (1974). Conversations with a two-month-old. *New Scientist*, **62**, no. 896. 230–5.

Werner, H. & Kaplan, B. (1963). *Symbol formation*. New York: Wiley.