Prosodic/pragmatic interaction during the one-word stage in a single subject

Mildred Cook Fitzpatrick

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PROSODIC/PRAGMATIC INTERACTION
DURING THE ONE-WORD STAGE IN A SINGLE SUBJECT

by
Mildred Cook Fitzpatrick

B.A., Middlebury College, 1971
M.Ed, University of Montana, 1978

An Abstract

Of a thesis submitted in partial fulfillment of requirements for the degree in Master of Arts in the Department of Communications Sciences and Disorders in the Graduate School of the University of Montana

July, 1982

Approved by: Barbara Brown
Chairman, Board of Examiners

Dean, Graduate School

Date 8-5-82

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The purpose of this study was to determine prosodic/pragmatic interaction in a single subject, age 1;0 to 1;6. Specific questions were: 1) Which pragmatic categories does the subject exhibit, and what are their relative frequencies across time? 2) What are the relationships between patterns of usage of prosodic elements and the pragmatic categories? 3) How do this subject's prosodic patterns—and/or their relation to pragmatic intents—change over time? The subject was videotaped at the University of Montana Speech, Hearing, and Language Clinic for 21 sessions recorded over 25 weeks. Approximately 150 utterances were transcribed and categorized (as to pitch, intonation, loudness, and tempo, as well as pragmatic category) from each session. Data reduction indicated patterns of prosodic and pragmatic use derived from the total of 3042 transcribed utterances. General findings indicated that: 1) While pragmatic categories varied in their respective use, they remained relatively stable with regard to their percentage of occurrence across time; 2) This subject did not appear to exhibit prosodic contrastivity with regard to the pragmatic categories at the one-word stage, although some contrasts appeared to be emerging at the end of the study; 3) The subject relied heavily on a dominant prosodic pattern, consisting of average pitch, rising-falling intonation, average loudness, and average tempo.
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CHAPTER I
INTRODUCTION

During the last decade, the literature in very early language acquisition has reflected an increased interest in the study of language/communicative functions as opposed to language forms (Dore, Franklin, Miller and Ramer, 1976; Bruner, 1975; Halliday, 1975; Bates, Camioni, and Volterra, 1975; Dore, 1974; Bloom, 1973). The earlier focus on structural rules, an outgrowth of Chomsky's (1957) transformational model, has been interpreted by some to imply that "language structure was the basis of language acquisition" (McLean and Snyder-McLean, 1978:19). This structurally-based model has since been viewed as inadequate (nor did Chomsky apparently intend it) to describe children's communicative competence prior to the acquisition of syntax with the onset of two-word utterances (Bloom, 1973). Studies such as that of Snow (1977) have reflected an increased awareness of children's communicative (though not linguistic) competence very early on. She described "protoconversations" which occur between mothers and their infants. Similarly, Bates, et. al. (1975) attributed performative intentions to infants prior to the onset of first words. Indeed, the boundary of "first words" as the beginning of linguistic communication has been questioned by Halliday (1975). The study of pragmatics,
then, has been a primary focus of the recent literature, particularly in relation to children's very early communicative-language acquisition, from the prelinguistic stage to the onset of two-word utterances at about age 1;6 (Prutting, 1982; Ingram, 1976). The role of prosodic features in differentiating children's intents at this age has been discussed in the literature (Crystal, 1979; Dore, 1975; Halliday, 1975; Bloom, 1973), but due to lack of data has never been fully described. The purpose of the present study is to describe the relationship between pragmatic use and specific prosodic characteristics in one subject, age 1;0 to 1;6.

**Definition of Pragmatics**

Historically, two major frameworks have been proposed for the definition of pragmatics. One view held that the child's intentions in speaking are primarily interactional (Bruner, 1975). Bruner defined pragmatics as "...the directive function of speech through which speakers affect the behavior of others in trying to carry out their intentions" (1975:288). A contrastive belief, expressed by Halliday (1975) and others (Bates, 1976; Dore, 1975) defined pragmatics in such a way that the noninteractional aspects of language were included as well. Halliday, for instance, differentiated between the mathetic
(utterances contributing to the child learning about his/her environment), versus pragmatic (utterances involving social interactions) functions of language (1975). Further descriptions and definitions of pragmatics are located in Appendix A. For the purpose of the present study, pragmatics is defined as: The function or use to which communication/language is put, whether it be mathetic or interactional, always considered in relation to the total observable context of the environment at that point in time.

**Role of Intonation in the Expression of Intent: A Dearth of Data**

Although there is a common assumption in the literature that children signal their intentions via prosodic contrast, even in the prelinguistic stage (Bates, 1975; Halliday, 1975; Bruner, 1975; Tonkova-Yampol'skaya, 1973; Lenneberg, 1967) little data currently exists to either support or reject this assumption. A summary of studies in this area, and their findings, is included in Appendix B. Recent literature reflects disagreement in terms of the role of intonation and other prosodic elements in differentiating pragmatic intentions. Halliday (1975), for instance, described his subject's (Nigel's) use of different tones and intonations to convey specific meanings. Similarly, Dore referred to "holophrases," one-word utterances interpreted
to have a variety of meanings on the basis of context and intonation. Bloom (1973) questioned this kind of "rich interpretation" of children's utterances at the one-word stage. She stated that "different prosodic contours in this period may not distinguish the meanings or functions of utterances from one another" (1973:62). Bloom believed that greater prosodic contrastivity occurred subsequent to the acquisition of syntax, during the two-word stage of language development. Crystal (1979) appeared to concur with Bloom's view. He emphasized that little empirical study has taken place in the realm of prosodic development, and that "...situational interpretations cannot be taken at face value..." (44).

How, then, is one to judge these contradictory statements about the relationship of prosody to intent in the child's early language development? First of all, most of the studies have concentrated on individual children, who may have idiosyncratic styles in integrating the affective-cognitive, prosodic-interactional aspects of language. In addition, transitional stages in language development often have been ignored in the literature, particularly in relation to prosodic development (Crystal, 1979). Although there is a multitude of theories which imply a close interaction between pragmatic and prosodic contrasts in children's early communicative development.
(Halliday, 1975; Tonkova-Yampol'skaya, 1973), there remains a dearth of data on either individuals or groups of subjects. As shown in Appendix C, many of the studies lack reported inter- and intra-judge reliability checks; most (Halliday being the notable exception) do not reveal how intonation was transcribed; and many generalize on the basis of a small sample of utterances (which may be derived from one child). Halliday stated that the scarcity of literature on children younger than 18 months of age may be related in part to the fact that, at this stage, "...it is quite difficult to realize that the process of language learning is taking place at all..." (1975:9). He maintained that the child's system of language at this point "owes nothing to the adult language at all..." [but rather is] "a system of vocal postures, including the two components of articulation and intonation..." (1975:13). He added that transcription of children's early utterances, for this reason, is difficult, and that what "one requires is somewhat more in the nature of a prosodic notation..." (1975:13).

Hypotheses Concerning Prosodic Stages and Pragmatic Categories

Crystal has hypothesized five stages of prosodic development in the prelinguistic and one-word stages (Appendix D). However, he emphasized that, because of limited research in the area of
prosodic change in the very young child, "talk in terms of clear stages of development in this area may well be premature..." (1979:37).

Similarly, Dore (1974) and Halliday (1975) have devised organizational schemata for the analysis of pragmatic functions. These are summarized in Appendices E and F. Although Halliday transcribed Nigel's intonation contours, there have been few, if any, studies which have systematically described a child's pragmatic intentions in relation to prosody. Perhaps one reason is that the nonsegmental aspect of children's utterances generally has been considered to be of secondary importance; "That which is left after one has studied the vowel/consonant syllabic system of sounds" (Crystal, 1979:33). One must conclude that the relationship of prosody to intentionality in the child under two years of age remains unclear, in part due to lack of data. What the child actually intends to communicate at this stage (as opposed to how much adults infer from his/her utterances) remains equally unclear. Bloom's assertion that "There have been no studies on intonation and stress at this stage to determine contrastive status..." (1973:19) remains valid today. This writer hopes to provide relevant data in this domain with relation to one child (age 1;0 to 1;6).
Role of the Tone-Unit

The nature of the primary linguistic segment has been extensively debated; recently the syntagma (an organizational schema—Kozhevnivkov and Chistovich, 1965) or tone-unit (its output correlate—Dalton and Hardcastle, 1977) has been postulated as the prosodic basis for speech output. Lenneberg (1967) has referred to the "tonal patterns" which children acquire. Dore, et. al. (1976) stated that children acquire syntagmas rather than formal grammatical categories during the transitional stage between one- and two-word utterances. Syntagmas, first described by Kozhevnivkov and Chistovich (1965), have been characterized by Dore and his colleagues as "...prosodically complex patterns" (1976:26) which may serve as organizational schemata in the learning of speech. The occurrence of presyntactic devices (words plus "empty" phonetic forms within a single prosodic pattern) has been cited by Dore, et. al., as evidence that the child may use tone-units in relating sound to meaning. Similarly, Lieberman (1967) stated that the "...innate referential breath group..." (47) becomes the marker for complete sentences. The arguments of Kozhevnivkov and Chistovich, in particular, have convinced this writer that the syntagma is a logical organizational unit for speech formulation. Its output correlate, the tone-unit, appears to further integrate
linguistic and nonlinguistic aspects of the child's speech production.

**Rationale for Single-Subject Design**

Bloom (1973) alluded to the current disagreement in the literature concerning whether children use prosodic intonations contrastively prior to the acquisition of syntax with the onset of multiword utterances. This difference of opinion has not been adequately addressed up to the present time. A study in which the parameters are defined (other than anecdotally), reliability established, and sufficient data collected, perhaps would reveal patterns which may be tested in future studies. Far too many speculations have been offered with relation to the amount of data heretofore collected. As Ferguson and Farwell have commented in the context of general phonological studies,

"...some linguists might well be advised to turn away from writing rules of maximum generality and undertake instead highly detailed analyses of the idiosyncratic paths which particular children follow in learning to pronounce their languages (1975:48)."

**Purpose of the Present Study**

Just as Ferguson and Farwell (1975) noted in relation to phonological studies, there has been an overabundance of theorizing and too little data-collection and analysis with
relation to children's individual prosodic styles (and their possible relation with pragmatic intent). The purpose of the present study is to employ operationally-defined classes of pragmatic intents (derived from Dore, 1975: included in Appendix G) and specific prosodic classification categories (Appendix H) to determine the interactional patterns between the two across time, in a single subject age 1;0 to 1;6.

Research Questions

The research questions for the present study are as follows:

1. Which pragmatic categories does the subject (T.F.) exhibit, and what are their relative frequencies over time?

2. What are the relationships between patterns of usage of prosodic elements (including pitch, loudness, and tempo) and the above pragmatic categories?

3. How do this subject's prosodic patterns—and/or their relationship to pragmatic intents—change over time?
CHAPTER II

Subject

The subject was the author's daughter, age 1;0 at the initiation of the study and 1;6 at its termination. Hearing evaluations conducted at the University of Montana Speech, Hearing and Language Clinic indicated normal auditory sensitivity. Developmental milestones in this subject have been demonstrated to be within normal limits. Further developmental information is located in Appendix I.

Interaction

T.F. was video-taped as she interacted in a play mode with her mother. The author provided at least three opportunities for each pragmatic category to occur during each play session. Methods for providing these opportunities are outlined in Appendix J. The author provided opportunities for different pragmatic intents to occur as early in the session as possible. However, pragmatic intentions which the subject communicated spontaneously throughout the sample were counted toward the minimum number of opportunities provided. Elicitation of pragmatic categories was not to interfere with the "natural flow" of the parent's interactional style. General style of interaction is also outlined in Appendix K.
Setting

The sessions were recorded in a playroom at the University of Montana Speech, Hearing and Language Clinic. Since the subject's mother is a graduate student, T.F. had frequently played in this setting in the past. She was at ease in the clinic, and appeared to regard the taping room as "just another playroom." To check the validity of the sample, short taping sessions were made at least once a month in the subject's home, with all utterances recorded on audio-tape. In this manner, the variability of T.F.'s utterances produced at the clinic versus at home was assessed.

Time

T.F. was video-taped in the clinic once a week for three seven week intervals, with approximately two weeks between each seven-week segment. Thus, a total of 21 sessions were recorded over 25 weeks. The recording intervals were 30 minutes in length, and transcriptions were made for approximately 150 utterances in that time period, except for the occasions when 150 utterances were not produced in the time allotted.

Equipment

A video-recorder (Sony, Model VO 1800) was used in conjunction with a video camera (General Electric, Model 4TE2381).
to obtain video-recordings of all sessions. An audio-tape recorder (Akai, Model 1722-W) was also used in some taping sessions. Dates of the sessions, number of utterances transcribed per session, and whether the session was audio-taped as well as videotaped are included in Appendix L.

**Transcription of Utterances**

The subject's utterances were transcribed by the author, and a percentage of these were transcribed by an independent observer.

**Definition:** For the purposes of transcription procedures, utterances were defined in terms of the tone-unit. In adult speech, the tone-unit has been described as:

..a stretch of speech about six or seven syllables in length, usually bounded by pauses, and including one prominent syllable, which carries the major pitch movement of the group... (Dalton and Hardcastle, 1977:9).

In the speech of T.F., the tone-unit was defined as vocalizations or verbalizations occurring between pauses. Babbling, cries, laughter, some vegetative sounds (those which appeared to have a communicative intent), and words or approximations thereof were included.

**Transcription:** T.F.'s utterances were transcribed using the International Phonetic Alphabet (IPA) with the prosodic contours
marked. In addition, numerical values were assigned to prosodic and pragmatic categories, as described below under Categorization. Also, a record of the mother and child's utterances was made, including objects present, date, time and gestural information when the transcription alone did not provide sufficient data for analysis.

**Categorization:**

A. **Prosody.** Prosody was classified in four major areas: Pitch A (overall pitch level); Pitch B or intonation (direction of pitch change within the tone-unit); Loudness; and Tempo. All judgements were made perceptually. Appendix M contains a sample data sheet.

B. **Pragmatic Categories.** A numerical value was assigned to each of the pragmatic categories as previously described in Appendix G. Categories included in the present study were: Labeling, Repeating, Requesting Action, Requesting Answer, Answering, Calling, Greeting, Protesting, Practicing, Enjoying, and Other (Could Not Classify).

C. **Reliability.** Assessment of both inter- and intra-judge reliability was made. The second transcriber was trained on a practice tape to a criterion of 95% agreement with the author's transcription of that tape. One session prior to transcribing any tapes, and one session midway through the study
(a total of about 4 hours of training) were provided the independent transcriber. On both occasions the criterion percentage of agreement was achieved on the practice tape. One-third of the sessions throughout the course of the study were chosen as samples to obtain reliability measures. Fifty utterances from each of the chosen sessions (for a total of 350 utterances) were scored by the two independent judges, and a percentage agreement was derived for scoring the prosodic and pragmatic categories. Intra-judge reliability measures were derived from five-minute segments of selected tapes which previously had been scored. Further details of these procedures may be found in Appendix N.

Data Analyses

Relationships between prosodic and pragmatic categories were described. The number of utterances occurring in each pragmatic category for the transcribed utterances from each session was counted. Under each pragmatic category heading, number and percent of utterances falling under each prosodic category (Pitch A, Pitch B, Loudness, and Tempo) were determined. From these data, emerging patterns were described.

Termination of the Study

The present study terminated when the third seven-week
taping interval ended. At that time, T.F.'s age was 1;6, and her mean length of utterance in morphemes (Brown, 1973) was 1.47.
CHAPTER III

RESULTS

Reliability of Measures

50 utterances from seven language sessions (a total of 350 utterances; 11% of the total) were coded independently by the author and another observer. Details of the transcription, including judgements of the tone-unit boundaries, have also been included in Appendix N. Disagreements on the division of tone-units occurred on only 1% of the rated utterances. Reliability measures were not obtained for agreement on transcription of segmental phonetic elements since none of the research questions addressed this aspect of production. Percent agreement was based on a point-by-point analysis of the prosodic and pragmatic categories only. Average percent agreement was 87.9 (range: 84.0-93.6). In addition, intrajudge reliability measures were obtained on four, five-minute segments representative of the 21 sessions, for a total of 147 utterances. Intrajudge reliability was 93%.

Validity

Transcription of audiotapes recorded in the home throughout the 21-week period (obtained at approximately 3-week intervals) indicated that the subject produced similar prosodic and
pragmatic categories to those in the speech sample obtained in the clinical setting (details are included in Appendix 0).

**Language Measures and Criteria for Inclusion in the Results Section**

Language measures were designed to describe three main areas of the subject's language development over time: 1) The pragmatic categories which T.F. exhibited, and their frequency of occurrence; 2) Usage of prosodic elements, change in proportional use, and trends with relation to specific pragmatic categories; and 3) Overall changes in prosodic features exhibited by this subject.

Because of the large amount of data collected in the present study, the author found it necessary to establish criteria for inclusion or exclusion of data in the Results section. The purpose of this process has been to describe those categories and/or patterns which were most dominant in this subject or indicative of substantial change across time. Therefore, the criteria for including tabular, graphic, and descriptive representations in the body of this paper were as follows:

1. **Pragmatic Categories**: Pragmatic categories which occurred at least 5% of the time (mean) for any three-week taping segment were included in tables in the text and described. Those
which occurred less frequently were judged to be less-used patterns or those which were difficult to elicit in this study (further details are included in the Discussion section). Since only two pragmatic categories exhibited a mean change in use of equal to or greater than 10% change across the three seven week taping sessions (to the nearest whole percent), a rank order of occurrence of all pragmatic categories was also included, and is shown in Table 1. Also, standard deviations obtained for each category across the three taping sessions provided an additional measure of variability of occurrence. The rationale underlying the above criteria was to describe the most important trends with respect to pragmatic use in this subject over time. Data which did not meet the above criteria for inclusion in figures were judged to be pragmatic categories which occurred only infrequently in the clinical setting.

2. **Prosodic Features in Relation to Pragmatic Categories:** As for the pragmatic elements, prosodic elements which occurred more than 5% of the time with relation to specific intentions were included in tabular form (mean =5% for any of the three seven week time segments). To identify the prosodic features which evidenced the strongest change across time, features whose percent occurrence changed more than 10% across the three seven week taping periods were judged to represent "strong trends" and
## Table 1

**Rank-Order of Occurrence of Pragmatic Categories:**

*All Sessions: And for Each 7 Week Taping Segment*

*(Mean Percent Occurrence)*

<table>
<thead>
<tr>
<th>Category</th>
<th>Mean Percent Occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labeling</td>
<td>29.9</td>
</tr>
<tr>
<td>Req. Action</td>
<td>13.2</td>
</tr>
<tr>
<td>Answering</td>
<td>12.9</td>
</tr>
<tr>
<td>Practicing</td>
<td>11.9</td>
</tr>
<tr>
<td>Repeating</td>
<td>11.1</td>
</tr>
<tr>
<td>Enjoying</td>
<td>8.0</td>
</tr>
<tr>
<td>Protesting</td>
<td>4.4</td>
</tr>
<tr>
<td>Other (CNC)</td>
<td>3.6</td>
</tr>
<tr>
<td>Greeting</td>
<td>2.0</td>
</tr>
<tr>
<td>Req. Answer</td>
<td>1.8</td>
</tr>
<tr>
<td>Calling</td>
<td>0.3</td>
</tr>
</tbody>
</table>

### Note

The table provides the mean percent occurrence of pragmatic categories in all sessions and for each 7-week taping segment. The categories include Labeling, Req. Action, Answering, Practicing, Repeating, Enjoying, Protesting, Other (CNC), Greeting, Req. Answer, and Calling.
were represented in figures in the text.

3. General Prosodic Use/Change Across Time: The dominant prosodic features were measured (in terms of percent use) for each taping session and graphically represented across time. Single- and multiple-syllable average tempo categories were considered together, since rate is not ordinarily judged in terms of length of utterance. The author included single- and multiple-syllable categories for the purpose of gathering additional data which may be analyzed at some point in the future. In addition, each dominant element (average pitch, rising-falling intonation, average loudness, and average tempo) was analyzed in terms of its strength of occurrence across the 21 sessions. Assessment of the relative strength of the dominant prosodic feature between categories (pitch, intonation, loudness, and tempo) was also obtained.

Finally, an overall pattern, in which the above dominant prosodic elements occurred together for any utterance (average pitch, rising-falling intonation, average loudness, and average tempo), was measured in terms of percent occurrence. Pragmatic categories for which the above pattern fell below 50% occurrence for any seven week taping period were discussed further.
Results in Terms of the Research Questions

1. Pragmatic Categories Exhibited by T.F. and their Changes over Time: The number of utterances falling within a given pragmatic category was derived for each individual session, and a percentage of use for each category relative to the total number of utterances for that category was obtained. Graphic representations of pragmatic categories which occurred more than 5% of the time have been included in Figures 1-6. Figure 1 shows the interaction between the three most frequently-occurring categories (mean percent occurrence across all 21 sessions): Labeling, Requesting Action, and Answering. The next two most frequently-occurring categories, Practicing and Repeating, are depicted in Figure 2. Enjoying and Protesting, the last two categories which occurred more than 5% of the time (average) for any given three-week time period, are represented in Figure 3. The final three categories, Greeting, Requesting Answer, and Calling, were exhibited much less frequently by this subject in the setting under study. Greeting and Requesting Answer occurred less than 2% of the time overall, and Calling less than 1%.

Labeling was consistently the most frequent pragmatic category exhibited by this subject, occurring more than twice as often (average, across the 21 weeks) as the second most frequently used category, Requesting Answer (29.9% versus 13.2%
overall). Although the use of Labeling declined slightly during the second seven week taping period, its use increased to 34.1% of the total during the final seven week period (29.5%; 26.1%; 34.1%). (From this point on, unless otherwise indicated, percent use of pragmatic or prosodic elements for the three seven week taping periods will be indicated in parentheses in temporal order). Requesting Answer, the second most frequently used intent, increased slightly during the second seven-week time period, but demonstrated a mean which deviated by no more than 3% across the three time periods (12.2; 14.5; 12.9). Answering, the third-ranked pragmatic category, decreased in use from 15.8% during the first seven weeks to 10.7% and 12.2% during the second and third seven weeks, respectively. Interaction between the three categories described above is depicted in Figure 1.

Practicing was ranked fourth in use overall, averaging 11.9% across the 21 sessions. Its use increased more than that of any other category, 13.1% (5.8; 11.2; 18.6). Repeating, ranked fifth overall among the prosodic categories, increased almost 8% during the second seven weeks, but declined again during the third time period (7.2; 15.0; 10.9). The relationship between Practicing and Repeating, depicted graphically in Figure 2, showed generally similar trends of use, particularly during the third seven week period, when the two patterns were parallel to
FIGURE 1

INTERACTION OF THE THREE MOST FREQUENTLY OCCURRING PRAGMATIC CATEGORIES: LABELING, REQUESTING ACTION, & ANSWERING FOR ALL 21 SESSIONS (percent use per session)
each other (although, in contrast to the first seven week period, Practicing has assumed the lead).

Enjoying, which was ranked sixth among the pragmatic categories overall, and Protesting, which was ranked seventh, were the final two categories which were used more than 5% of the time during at least one of the three seven week time periods. Enjoying showed a marked decline across time (12.7; 8.7; 2.8), a 9.9 point decrease between the first and third periods; while Protesting showed an increase during the second seven weeks, and then declined in use during the final period (4.4; 8.1; 3.2). The interactions between these two categories show generally opposite trends for any given session; in the majority of cases, when Enjoying increased, Protesting decreased and the reciprocal (Figure 3). Enjoying, which decreased nearly 10% across time, was second only to Practicing in terms of average change across time (the occurrence of Practicing, as already mentioned, increased).

In addition to the interactions represented above, the author chose several other pragmatic categories of interest (which also met the criterion of greater than 5% use across time) to depict graphically. The interaction between Labeling and Practicing is represented in Figure 4; between Repeating and
FIGURE 3
RELATIONSHIP BETWEEN THE PRAGMATIC CATEGORIES, PROTESTING AND ENJOYING
(percent use/session)
Requesting Action in Figure 5; and between Protesting and Requesting Action in Figure 6.

Variability of occurrence of categories across sessions was assessed by computing the range and standard deviation for each pragmatic category. Categories judged to be highly variable—demonstrating a standard deviation of more than 10 points from the mean—included the two most frequently-occurring categories (Labeling and Requesting Action). The other two highly variable categories were Practicing (ranked fourth in frequency of occurrence overall and also the category which showed the greatest average change across the three seven week sessions) and Enjoying (ranked sixth in frequency overall, and the category which showed the second greatest average change across sessions). Details are included in Table 2. Figures 7-10 represent the percent use of the pragmatic categories over the total 21 weeks and for the three seven week time divisions.

2. Relationship Between Prosodic use and Pragmatic Categories. A frequency and percent occurrence of each prosodic feature relative to each pragmatic category was derived for all 21 sessions. From this data reduction, average occurrence of each prosodic feature relative to the pragmatic categories for the three seven week time divisions was computed. Tables 3-6
FIGURE 5
INTERACTION BETWEEN THE PRAGMATIC CATEGORIES, REPEATING
AND REQUESTING ACTION
(percent use/session)

Session Numbers

Percent Occurrence/Session

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TABLE 2

RANK-ORDER OF PRAGMATIC CATEGORIES WITH REGARD TO VARIABILITY
AS MEASURED BY STANDARD DEVIATIONS FOR ALL SESSIONS (N₁)
AND THE THREE SEVEN WEEK TIME PERIODS

(N₁, N₂, and N₃)

<table>
<thead>
<tr>
<th>PRAGMATIC CATEGORIES</th>
<th>TIME PERIOD (SESSIONS)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N₁ (1-21)</td>
</tr>
<tr>
<td></td>
<td>R (f); S.D.</td>
</tr>
<tr>
<td>1. Labeling</td>
<td>43.8; 10.9</td>
</tr>
<tr>
<td>2. Practicing</td>
<td>17.4; 10.9</td>
</tr>
<tr>
<td>3. Requesting Action</td>
<td>19.3; 10.7</td>
</tr>
<tr>
<td>4. Enjoying</td>
<td>11.8; 10.7</td>
</tr>
<tr>
<td>5. Repeating</td>
<td>16.2; 7.9</td>
</tr>
<tr>
<td>6. Protesting</td>
<td>6.5; 7.1</td>
</tr>
<tr>
<td>7. Answering</td>
<td>18.9; 6.9</td>
</tr>
<tr>
<td>8. Requesting Answer</td>
<td>2.6; 3.9</td>
</tr>
<tr>
<td>9. Other</td>
<td>5.2; 3.7</td>
</tr>
</tbody>
</table>

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FREQUENCY DISTRIBUTIONS FOR
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PRAGMATIC CATEGORY
FIRST SEVEN SESSIONS ONLY

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FREQUENCY DISTRIBUTIONS FOR PRAGMATIC CATEGORY LAST SEVEN SESSIONS ONLY
represent interactions between the prosodic and pragmatic categories. Features which occurred less than 5% of the time for all three seven week periods have been omitted from the tables. Strong trends—defined as prosodic elements whose mean percent occurrence increased or decreased more than 10% across the three time divisions, have been included in Figures 11-30.

A. Pitch A (General pitch level, defined in terms of high, average, low, not applicable—as in whisper—and variable) demonstrated a dominant use of the average pitch in all but two categories, Protesting and Enjoying, which were dominated by nonlinguistic expressions of intent. In these categories, the inclusion of crying and laughing, respectively, placed the average pitch in second place overall. Cries used to express Protesting declined markedly during the second time period, but rose again during the third seven weeks (80.0; 26.3; 55.9); correspondingly, the use of the average pitch rose from 17.8% during the first seven week period, to 68.4% during the second seven weeks, and down to 44.1% during the third seven weeks (Figure 11). The category, Enjoying, demonstrated the use of
TABLE 3  
INTERACTION OF PITCH A WITH PRAGMATIC CATEGORIES: 
FOR THE FIRST SEVEN WEEKS (N$_1$), 
SECOND SEVEN WEEKS (N$_2$) AND 
THIRD SEVEN WEEKS (N$_3$)*

<table>
<thead>
<tr>
<th>Pragmatic Categories</th>
<th>High</th>
<th>Average</th>
<th>Variable</th>
<th>Cry</th>
<th>Laugh</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N$_1$</td>
<td>N$_2$</td>
<td>N$_3$</td>
<td>N$_1$</td>
<td>N$_2$</td>
</tr>
<tr>
<td>Labeling</td>
<td>13.6</td>
<td>5.2</td>
<td>7.4</td>
<td>83.0</td>
<td>93.9</td>
</tr>
<tr>
<td>Repeating</td>
<td>13.5</td>
<td>6.5</td>
<td>1.8</td>
<td>79.7</td>
<td>92.8</td>
</tr>
<tr>
<td>Request, Act.</td>
<td>4.8</td>
<td>17.0</td>
<td>7.5</td>
<td>86.4</td>
<td>81.0</td>
</tr>
<tr>
<td>Request, Answ.</td>
<td>32.4</td>
<td>20.0</td>
<td>0.0</td>
<td>67.6</td>
<td>80.0</td>
</tr>
<tr>
<td>Answering</td>
<td>9.3</td>
<td>1.8</td>
<td>0.8</td>
<td>90.1</td>
<td>97.2</td>
</tr>
<tr>
<td>Calling</td>
<td>------</td>
<td>-------</td>
<td>-------</td>
<td>0.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Greeting</td>
<td>17.9</td>
<td>14.3</td>
<td>0.0</td>
<td>82.1</td>
<td>85.7</td>
</tr>
<tr>
<td>Protest</td>
<td>------</td>
<td>-------</td>
<td>-------</td>
<td>17.8</td>
<td>68.4</td>
</tr>
<tr>
<td>Practicing</td>
<td>3.2</td>
<td>2.6</td>
<td>6.8</td>
<td>95.0</td>
<td>96.5</td>
</tr>
<tr>
<td>Enjoying</td>
<td>13.8</td>
<td>18.2</td>
<td>24.1</td>
<td>31.5</td>
<td>31.8</td>
</tr>
</tbody>
</table>

*---: Categories excluded from the table because they did not achieve 5% use for any of the three time periods.

In addition, LOW and NOT APPLICABLE did not achieve 5% use for any of the three time periods.
<table>
<thead>
<tr>
<th>Pragmatic Categories</th>
<th>Intonation Types</th>
<th>RISING</th>
<th>LEVEL</th>
<th>FALLING</th>
<th>RISE-FALLING</th>
<th>OTHER</th>
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<td></td>
<td>N1</td>
<td>N2</td>
<td>N3</td>
<td>N1</td>
<td>N2</td>
<td>N3</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Repeating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Request. Act.</td>
<td>0.8</td>
<td>1.4</td>
<td>24.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Request. Answ.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Answering</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calling</td>
<td>0.0</td>
<td>0.0</td>
<td>100.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greeting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protesting</td>
<td>6.7</td>
<td>7.0</td>
<td>2.9</td>
<td>6.7</td>
<td>8.8</td>
<td>0.0</td>
</tr>
<tr>
<td>Practicing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enjoying</td>
<td>5.3</td>
<td>2.3</td>
<td>17.2</td>
<td>6.2</td>
<td>8.0</td>
<td>10.3</td>
</tr>
</tbody>
</table>

*---: Categories excluded from the table because they did not achieve 5% use for any of the three time periods.

**: Protesting was dominated by a nonlinguistic expression of intent, Crying (80.0; 26.3; 55.9)

***: Enjoying was dominated by a nonlinguistic expression of intent, Laughing (50.0; 47.7; 31.0)
<table>
<thead>
<tr>
<th>Pragmatic Categories</th>
<th>LOUD</th>
<th>AVERAGE</th>
<th>SOFT</th>
<th>CRY</th>
<th>LAUGH</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>N₁</td>
<td>N₂</td>
<td>N₃</td>
<td>N₁</td>
<td>N₂</td>
</tr>
<tr>
<td>Labeling</td>
<td>6.3</td>
<td>6.8</td>
<td>12.7</td>
<td>88.0</td>
<td>89.1</td>
</tr>
<tr>
<td>Repeating</td>
<td>4.1</td>
<td>9.8</td>
<td>14.2</td>
<td>85.1</td>
<td>84.3</td>
</tr>
<tr>
<td>Request. Act.</td>
<td>8.8</td>
<td>12.2</td>
<td>29.3</td>
<td>84.8</td>
<td>85.7</td>
</tr>
<tr>
<td>Request. Answer.</td>
<td>21.6</td>
<td>20.0</td>
<td>0.0</td>
<td>78.4</td>
<td>80.0</td>
</tr>
<tr>
<td>Answering</td>
<td>6.8</td>
<td>5.5</td>
<td>8.7</td>
<td>87.6</td>
<td>89.0</td>
</tr>
<tr>
<td>Calling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greeting</td>
<td>0.0</td>
<td>0.0</td>
<td>5.6</td>
<td>100.0</td>
<td>85.7</td>
</tr>
<tr>
<td>Protest.</td>
<td>0.0</td>
<td>29.8</td>
<td>2.9</td>
<td>20.0</td>
<td>43.9</td>
</tr>
<tr>
<td>Practicing</td>
<td>3.3</td>
<td>5.3</td>
<td>16.7</td>
<td>91.7</td>
<td>93.0</td>
</tr>
<tr>
<td>Enjoying</td>
<td>3.8</td>
<td>3.4</td>
<td>13.8</td>
<td>36.9</td>
<td>44.3</td>
</tr>
</tbody>
</table>

*—Categories excluded from the table because they did not achieve 5% use for any of the three time periods.

In addition, VARIABLE loudness did not achieve 5% use for any of the three time periods.
### TABLE 6

**MEAN PERCENT OCCURRENCE OF TEMPO CATEGORIES RELATIVE TO PRAGMATIC CATEGORIES**

FOR THE FIRST SEVEN WEEKS ($N_1$),
SECOND SEVEN WEEKS ($N_2$) and
THIRD SEVEN WEEKS ($N_3$)*

<table>
<thead>
<tr>
<th>Pragmatic Categories</th>
<th>FAST S-S</th>
<th>AV. S-S</th>
<th>SLOW S-S</th>
<th>AV. H-S</th>
<th>CRY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$N_1$</td>
<td>$N_2$</td>
<td>$N_3$</td>
<td>$N_1$</td>
<td>$N_2$</td>
</tr>
<tr>
<td>Labeling</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Repeating</td>
<td>6.8</td>
<td>11.1</td>
<td>3.5</td>
<td>48.6</td>
<td>40.5</td>
</tr>
<tr>
<td>Request. Act.</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Request. Ans.</td>
<td>5.4</td>
<td>10.0</td>
<td>28.6</td>
<td>83.8</td>
<td>90.0</td>
</tr>
<tr>
<td>Answering</td>
<td>3.7</td>
<td>6.4</td>
<td>2.3</td>
<td>85.1</td>
<td>64.2</td>
</tr>
<tr>
<td>Calling</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Greeting</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Protesting</td>
<td>4.4</td>
<td>40.4</td>
<td>8.8</td>
<td>4.4</td>
<td>29.8</td>
</tr>
<tr>
<td>Practicing</td>
<td>1.7</td>
<td>9.6</td>
<td>4.2</td>
<td>65.0</td>
<td>43.0</td>
</tr>
<tr>
<td>Enjoying</td>
<td>6.5</td>
<td>4.5</td>
<td>13.8</td>
<td>24.6</td>
<td>29.5</td>
</tr>
</tbody>
</table>

*----: Categories for which 5% use was not achieved for any of the three time periods.

In addition, FAST, SLOW, and VARIABLE multiple-syllable utterances did not achieve 5% use for any of the three time periods.
TABLE 6, continued

MEAN PERCENT OCCURRENCE OF TEMPO CATEGORIES RELATIVE TO PRAGMATIC CATEGORIES
FOR THE FIRST SEVEN WEEKS \(N_1\),
SECOND SEVEN WEEKS \(N_2\), and
THIRD SEVEN WEEKS \(N_3\)*

<table>
<thead>
<tr>
<th>Pragmatic Categories</th>
<th>LAUGH (N_1)</th>
<th>(N_2)</th>
<th>(N_3)</th>
<th>AVERAGE S-S and M-S (N_1)</th>
<th>(N_2)</th>
<th>(N_3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labeling</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>94.3</td>
<td>93.6</td>
<td>94.4</td>
</tr>
<tr>
<td>Repeating</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>83.7</td>
<td>83.6</td>
<td>96.5</td>
</tr>
<tr>
<td>Request, Act.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>92.0</td>
<td>96.6</td>
<td>96.2</td>
</tr>
<tr>
<td>Request, Answ.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>94.6</td>
<td>90.0</td>
<td>71.4</td>
</tr>
<tr>
<td>Answering</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>95.0</td>
<td>88.1</td>
<td>96.8</td>
</tr>
<tr>
<td>Calling</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Greeting</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>92.8</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Protesting</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>11.1</td>
<td>33.3</td>
<td>33.3</td>
</tr>
<tr>
<td>Practicing</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>98.3</td>
<td>87.7</td>
<td>95.3</td>
</tr>
<tr>
<td>Enjoying</td>
<td>50.0</td>
<td>47.7</td>
<td>31.0</td>
<td>38.4</td>
<td>46.5</td>
<td>48.2</td>
</tr>
</tbody>
</table>

*----Categories for which 5% use was not achieved for any of the time periods.
FIGURE 11

INTERACTION OF PITCH A VARIABLES:

PROTESTING

Percent Use per Time Period

CRY

AVERAGE

Seven week time periods

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laughter more strongly at the beginning of the study, but then showed a steady decline in its use (50.0; 47.7; 31.0) across time. Correspondingly, the average pitch increased across time (31.5; 31.8; 44.8). Unlike Protesting, however, the use of a high pitch to reflect enjoyment demonstrated a more than 10% increase across time (13.8; 18.2; 24.1). Figure 12 shows the interaction of pitch variables for the pragmatic category, Enjoying.

Other strong trends in terms of general pitch included: An increase in the use of high pitch to express the category, Requesting Action, during the second seven weeks, only to decline during the final taping period (4.8; 17.0; 7.5); and a decline in the use of high pitch for the categories Requesting Answer and Greeting (32.4; 20.0; 0 for Requesting Answer; and 17.0; 14.3; and 0 for Greeting). Figures 13-15 detail these trends. Repeating also demonstrated a reduction in the use of high pitch across time (13.5; 6.5; 1.8), as shown in Figure 16.

B. Pitch B (Intonation): Pitch B was defined in terms of rising, level, falling, rising-falling, and other for the purposes of classification. Similar to the pattern shown under
FIGURE 12
INTERACTION OF PITCH A VARIABLES:
ENJOYING

![Graph depicting the interaction of pitch variables over seven week time periods. The graph shows lines for 'Laugh', 'Average', and 'High' indicating changes in usage per time period.](image-url)
FIGURE 13
INTERACTION OF PITCH A VARIABLES:
REQUESTING ACTION

Seven week time periods

Percent Use per Time Period

AVERAGE

HIGH

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FIGURE 14

INTERACTION OF PITCH A VARIABLES:

REQUESTING ANSWER

Seven week time periods
FIGURE 15

INTERACTION OF PITCH A VARIABLES:

GREETING

Seven week time periods
FIGURE 16
INTERACTION OF PITCH A VARIABLES:
REPEATING

Seven week time periods

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general overall pitch (Pitch A), the rising-falling intonation remained dominant for all categories except Protesting and Enjoying, which again were dominated by nonlinguistic elements, crying and laughing respectively. Protesting (Figure 17) again showed declining use of crying during the second seven weeks but an increase during the third, with a concurrent fluctuation of the rising-falling intonation (6.7; 54.4; 38.2). Enjoying, as mentioned above, declined across time, and the use of the average pitch showed a slight increase during the same period (Figure 18). A stronger change, however, occurred in the use of a rising pitch to express enjoyment—an increase of almost 12% across time (5.3; 2.3; 17.2). In addition to their changing trends, Protesting and Enjoying demonstrated the greatest number of "secondary" categories (elements used more than 5% of the time for any seven week time period) with three apiece (Table 4).

The strongest intonational trend which was unrelated to the use of nonlinguistic expressions of intent, was the substantial increase in the rising intonation to express Requesting Action (Figure 19)—a 23.3% increase—during the third time period (.8; 1.4; 24.8). The category Calling will not be discussed since it
FIGURE 17

INTERACTION OF PITCH B (INTONATION) VARIABLES:

PROTESTING

Seven week time periods

Percent use per time period

$\bar{x}(N_1)$  $\bar{x}(N_2)$  $x(N_3)$

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FIGURE 18
INTERACTION OF PITCH B (INTONATION) VARIABLES FOR
ENJOYING

Seven week time periods

Percent Use Per Time Period

LAUGH

AVERAGE

HIGH
occurred so infrequently. Another trend which demonstrated a more than 10% change across time was the use of the "other" intonation to express Greeting (Figure 20) during the second seven weeks (0; 14.3; 0), which was not used during either of the other time periods.

C. Loudness: Loudness was categorized in terms of loud, average, soft, and variable perceptions of speech intensity. Again, with the exception of Protesting and Enjoying, the average loudness was the dominant prosodic feature for all other pragmatic categories. Loudness increased over time for all pragmatic categories except Requesting Answer and Protesting (again, the trend for Calling involved few cases). Those categories which demonstrated a greater than 10% increase in loudness across time included (Figures 21-24): Repeating (4.1; 9.8; 14.2); Requesting Action (8.8; 12.2; 29.3); Practicing (3.3; 5.3; 16.7); and Enjoying (3.8; 3.4; 13.8). Of these, the change within the category Requesting Action was the strongest—a more than 20% average increase across the three taping periods.

Protesting demonstrated an increase in the use of loud speech (Figure 25) during the second seven weeks, concurrent with an increase in linguistic verbalizations to express Protesting
FIGURE 19

INTERACTION OF PITCH B (INTONATION) VARIABLES:

REQUESTING ACTION

AVERAGE

HIGH

Percent Use Per Time Period

Seven week time periods
FIGURE 20

INTERACTION OF PITCH B (INTONATION) VARIABLES:

GREETING

Percent Use Per Time Period

Seven week time periods
FIGURE 21

INTERACTION OF LOUDNESS VARIABLES:

REPEATING

AVERAGE

LOUD

Seven week time periods
FIGURE 22

INTERACTION OF LOUDNESS VARIABLES:

REQUESTING ACTION

Seven week time periods
FIGURE 23

INTERACTION OF LOUDNESS VARIABLES:

PRACTICING

Percent Use Per Time Period

Seven week time periods

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FIGURE 24
INTERACTION OF LOUDNESS VARIABLES:
ENJOYING

Seven week time periods

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(0; 29.8; 2.9 for loud speech, versus 80; 26.3; 55.9 for crying). Strong trends with the increased use of a soft voice were demonstrated in the category, Greeting (Figure 26), which reflected its use during the second seven weeks only (0; 14.3; 0); Requesting Answer (0; 0; 28.6), which showed a strong trend which should be viewed cautiously due to the small number of instances during the final time division (Figure 27); and Enjoying (already depicted in Figure 24), which showed a simultaneous increase in both loud and soft speech during the final seven weeks (loud=3.8; 3.4; 13.8; soft=9.2; 4.5; 20.7). Enjoying, then, demonstrated the greatest range in loudness during the last time division—four categories which reflected greater than 10% use.

D. Tempo: With the exception of the Protesting and Enjoying categories (as for all other prosodic/pragmatic interactions) the use of the average tempo was dominant for all pragmatic categories across time. Only two trends of greater than 10% change were noted: The use of a short single-syllable utterance to express Protesting (Figure 28) during the second seven weeks, concurrent with more linguistic expressions of this
FIGURE 25

INTERACTION OF LOUDNESS VARIABLES:

PROTESTING

[Graph depicting the interaction of loudness variables over seven week time periods.]

Percent Use Per Time Period

CRY

AVERAGE

LOUD

\( \bar{x}(N_1) \)

\( \bar{x}(N_2) \)

\( \bar{x}(N_3) \)

Seven week time periods
FIGURE 26
INTERACTION OF LOUDNESS VARIABLES:
GREETING

Seven week time periods
FIGURE 27

INTERACTION OF LOUDNESS VARIABLES:

REQUESTING ANSWER

![Graph showing interaction of loudness variables over seven week time periods. The graph depicts the percentage use per time period for soft, average, and loud categories, with data points for each time period marked.](image-url)
intention (4.4; 40.4; 8.8); and the increased use of the short single-syllable utterance to express Requesting Answer (Figure 29) across time (5.4; 10; 29.6). Again, the reader is cautioned with regard to the small number of instances of this category during the last time division.

E. Interaction of Prosodic Variables with Relation to Specific Pragmatic Categories: The strongest interactive trends involved pragmatic categories which demonstrated a simultaneous pattern of change in which two or more prosodic elements demonstrated a greater than 10% change across time. The category, Requesting Action, demonstrated strong change during the last seven week period with respect to the adoption of a rising intonation and increased loudness to express this intent—a greater than 20% change in both areas (Figure 30). A soft voice concurrent with rapid speech was used to express Greeting during the second seven week period (Figure 31). Similarly, during the second time period more use was made of loud and rapid speech to express the pragmatic category Protesting (Figure 32). Enjoying (Tables 3-6) demonstrated the widest variety of prosodic use of any pragmatic category, with the smallest values for the typically "dominant" prosodic
FIGURE 28

INTERACTION OF TEMPO VARIABLES:

PROTESTING

[Graph showing the interaction of tempo variables over seven week time periods.]

Seven week time periods
FIGURE 29

INTERACTION OF TEMPO VARIABLES:

REQUESTING ANSWER

Seven week time periods
FIGURE 30
INTERACTION OF RISING PITCH AND INCREASED LOUDNESS:
REQUESTING ACTION

Percent Use Per Time Period

RISING PITCH

LOUD

Seven week time periods

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FIGURE 31

INTERACTION BETWEEN SOFT SPEECH
AND OTHER INTONATION:

GREETING

Seven week time periods
FIGURE 32
INTERACTION OF LOUD & FAST
SPEECH: PROTESTING

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elements. Overall prosodic use has been charted across time with respect to Pitch A (Figures 33-36); Pitch B or intonation (Figures 37-40); Loudness (Figures 41-44); and Tempo (Figures 45-48) for the total sessions and each seven week time division.

3. Prosodic Use/Change Across Time: The average pitch (Pitch A), the rising-falling intonation (Pitch B), average Loudness, and average Tempo were the most frequently used (dominant) prosodic elements, for all pragmatic categories except Protesting and Enjoying. In most cases, use of the "dominant" element strengthened across time (Figures 33-48). The strongest trend was in the use of the average tempo. Even averaging in Protesting and Enjoying, mean use of this tempo across all 21 sessions was 85.1%. The next most typical pattern was the use of the rising-falling intonation, used in 83.5% of the subject's utterances across time; followed by average pitch, with a mean use of 82.6%. The least-used (although not greatly so) category was that of average loudness, which occurred 78.3% of the time. A graphic representation of the interaction between each dominant prosodic element across time is represented in Figure 49.

For many of the subject's utterances, all four 'dominant' prosodic elements occurred together: average pitch,
FREQUENCY DISTRIBUTIONS FOR PITCH A

AVERAGE
25.8
32.6%

HIGH
2%
8.2%

LAUGH
1.6%
3.8%

COULD NOT TEST
29
0.9%

CRY
74
2.4%

VARIABLE
45
1.5%

N/A
6
0.2%

LOW
13
0.4%
FIGURE 34

FREQUENCY DISTRIBUTIONS FOR
PITCH A
FIRST SEVEN SESSIONS ONLY
FIGURE 35

PITCH A
SECOND SEVEN SESSIONS ONLY

AVERAGE 857
84.4%

HIGH
81
8.0%

LAUGH
42
4.1%

COULD NOT TEST
9
0.9%

CRY
17
1.7%

VARIABLE
9
0.9%
FREQUENCY DISTRIBUTIONS FOR
LAST SEVEN SESSIONS ONLY

FIGURE 36

- HIGH
- LAUGH
- COULD NOT TEST
- VARIATION

- AVERAGE
- 219
- 85.8%

13.5%
17.4%
9%
9.1%
0.4%
0.5%
0.5%

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FIGURE 38

FREQUENCY DISTRIBUTIONS FOR
PITCH B
FIRST SEVEN SESSIONS ONLY

RISE/FALL 815
79.7%

FALLING 21
2.1%

LEVEL 41
4.0%

RISING 19
1.9%

LAUGH 65
6.4%

COULD NOT TEST 11
1.1%

CRY 38
3.7%

OTHER 12
1.2%
FREQUENCY DISTRIBUTIONS FOR PITCH B SECOND SEVEN SESSIONS ONLY

- Falling: 23.5%
- Level: 41%
- Rising: 14%
- Laugh: 2.5%
- Others: 4%
- Could Not Test: 2.5%

Free Fall: 9.17%
FREQUENCY DISTRIBUTIONS FOR
LAST SEVEN SESSIONS. ONLY

FIGURE 40

PITCH B

Falling 1.1%
Level 1.3%
Rising 5.8%
Laugh 1.0%
Could Not Test 9%
Cry 19%
Other 1.3%
Rise/Fall 57.0%
FREQUENCY DISTRIBUTIONS FOR LOUDNESS

- Loud: 3.8%
- Average: 79.5%
- Cry: 2.4%
- Variable: 0.2%
- Soft: 4.7%
- Could Not Test: 0.9%
- Laugh: 1.6%
FIGURE 42

FREQUENCY DISTRIBUTIONS FOR LOUDNESS
FIRST SEVEN SESSIONS ONLY

- **Average**: 73.3, 76.6%
- **Soft**: 50, 4.9%
- **Cry**: 35, 3.7%
- **Could Not Test**: 11, 1.1%
- **Laugh**: 65, 6.4%
- **Loud**: 74, 7.2%
FIGURE 43
FREQUENCY DISTRIBUTIONS FOR LOUDNESS
SECOND SEVEN SESSIONS ONLY

LAUGH
42
4.1%

COULD NOT TEST
5
0.9%

CRY
17
1.7%

VARIABLE
2
0.2%

SOFT
42
3.1%

AVERAGE
815
60.2%

LOUD
89
8.3%
rising-falling intonation, average loudness, and average tempo in a single utterance. When only the utterances which demonstrated this overall pattern were considered, a strong dominant trend emerged (Table 7). Pragmatic categories which were not expressed by this pattern at least 50% of the time for all three time divisions were only three in number (the criterion of 50% was set because it implies a "dominant" pattern): Protesting (22.0; 19.2; 12.4); Enjoying (16.9; 12.5; 13.8); and Requesting Action during the third seven week period only (66.4; 74.1; 41.4). When pragmatic boundaries were not considered, the use of the dominant pattern increased slightly across time, from 55.8% during the first seven weeks, to 63.0 and 62.8% during the second and third seven weeks respectively. Implications of the above findings with relation to all three research questions, and their relevance to assumptions made heretofore in the literature, are discussed below.
Figure 44: Frequency distributions for last seven sessions only.
FREQUENCY DISTRIBUTIONS FOR TEMPO

- Short 1 Syllable: 5.5%
- Laugh: 11.6%
- Could Not Test: 3.9%
- Cry: 2.1%
- Slow CT 1 Syll: 0.2%
- Average CT 1 Syll: 97.8%
- Fast: 5.8%
- Long 1 Syll: 18%
- Average 1 Syll: 53.3%

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FIGURE 46

FREQUENCY DISTRIBUTIONS FOR TEMPO
FIRST SEVEN SESSIONS ONLY
FREQUENCY DISTRIBUTIONS FOR TEMPO SEVEN SESSIONS ONLY

**Figure 47**

- Short 1 syll. 9.9%
- Average 1 syll. 48.1%
- Long 1 syll. 21.1%
- Cry 17.2%
- Could not test 0.9%
- Slow 1 syll. 0.3%
- Laugh 0.1%
FREQUENCY DISTRIBUTIONS FOR TEMPO LAST SEVEN SESSIONS ONLY

- Short 1 syllable: 45.3%
- Average 1 syllable: 36.7%
- Average 6 to 15 syllables: 15.5%
- Long syllable: 0.5%
- Cry: 1.8%
- Laugh: 0.9%
- Could not test: 0.1%

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**TABLE 7**

**MEAN PERCENT USE OF THE DOMINANT PROSODIC PATTERN**

**RELATIVE TO EACH PRAGMATIC CATEGORY**

**FOR THE 3 TIME DIVISIONS**

\[ N_1, N_2, \text{ and } N_3 \]

<table>
<thead>
<tr>
<th>Pragmatic Categories</th>
<th>Time Period and Session Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N1 (1-7)</td>
</tr>
<tr>
<td>Labeling</td>
<td>67.1</td>
</tr>
<tr>
<td>Repeating</td>
<td>56.8</td>
</tr>
<tr>
<td>Request. Act.</td>
<td>66.4</td>
</tr>
<tr>
<td>Request. Answ.</td>
<td>51.3</td>
</tr>
<tr>
<td>Answering</td>
<td>72.7</td>
</tr>
<tr>
<td>Calling</td>
<td>0.0</td>
</tr>
<tr>
<td>Greeting</td>
<td>71.4</td>
</tr>
<tr>
<td>Protesting</td>
<td>20.0</td>
</tr>
<tr>
<td>Practicing</td>
<td>83.3</td>
</tr>
<tr>
<td>Enjoying</td>
<td>62.0</td>
</tr>
<tr>
<td>ALL CATEGORIES</td>
<td>58.5</td>
</tr>
</tbody>
</table>

*Average Pitch, Rising-Falling Intonation, Average Loudness and Average Tempo*
CHAPTER IV
DISCUSSION

The purpose of the present study was to describe the interaction between operationally defined pragmatic categories and prosodic use over a six-month time period. Possible explanations for the results obtained with regard to the specific research questions, relationships of these results to those of past investigators, limitations of the study, and implications for future research are addressed in this section.

Implications of the Current Findings

Pragmatic Categories Used by T.F. and their Change Across Time: Labeling was used more than twice as often as any other pragmatic category by this subject across the 21 sessions. Labeling is a common referring expression, which pertains to both actions and objects, and the subject frequently employed it in commenting on the most salient features of the environment with her communicative partner. At times the subject appeared to desire a response or confirmation, such as "Yes, that's a doggy," while at others she seemed content to just label the objects.
This distinction may have been marked more by facial expressions or gestural information than by prosody, since labeling made strong use of all the dominant prosodic elements across time. Given the number of occurrences of the Labeling category, the author was puzzled by the relatively few occurrences in this setting of Requesting Answer. Since T.F.'s vocabulary appeared to be expanding rapidly at this time, one would have assumed that she might have used Requesting Answer as a strategy to learn the names of unfamiliar objects (i.e., "Dat?" cited as an example by Dore, et. al., 1976). Several reasons may be hypothesized for the subject's infrequent use of verbal requests for answer, at least in this setting. First, the nature of the interaction between mother and child, in the clinical setting, may have accounted for so few of the subject's utterances requiring a verbal response. The clinic, while obviously a situation in which T.F. felt at ease, was somewhat novel: New toys, new activities, and her mother's consistently undivided attention. While the unfamiliar toys (which were purposely included to elicit this pragmatic category) may have been assumed to stimulate queries as to their names, the mother's style—which was to frequently name new objects and activities, perhaps even before the subject had a need to ask—may have precluded some occurrences of Requesting Answer. Second, there is some evidence
that children may use overextensions (e.g., calling all four-legged animals "dog") as a request for answer, or as a form of hypothesis testing (Bloom and Lahey, 1978; Brown, 1965). T.F. was usually not hesitant to name unfamiliar objects (e.g., calling a hippopotamus a "horse" in one of the early sessions), and her mother would often reply with a statement like, "Yes, that looks like a horse; it's a hippo." In other words, T.F. may have developed strategies that were not immediately apparent in order to glean verbal information about her environment. Third, since children's linguistic productions are often phonologically unstable at this age (Ingram, 1976), T.F. may have used a sound or word for Requesting Answer that the author was unable to isolate. Given the subject's rapidly-expanding vocabulary, the relatively infrequent use of obvious requests for answer at first seemed puzzling; but given the nature of the mother-child interaction in the setting under study, particularly, the data appear less discrepant.

Requesting Action, unlike Requesting Answer, was commonly used, and remained second only to Labeling in average use across all sessions. While the category was variable in terms of use from session to session (as was Labeling) its average use across the three seven-week time divisions remained relatively stable. Seemingly, then, while use of Requesting Action may have varied
according to the subject's mood or the specific situation (e.g., whether the toys placed out of reach were desirable to the subject at that moment), overall use of this category remained strong across time. T.F. used effective strategies to obtain desired ends; for instance, on many of the transcribed tapes, she would repeat what she wanted several times. (Because their intent was obviously to motivate the parent to act, self-repetitions under Requesting Action were not scored as Practicing). While one might argue that scoring repetitions of Requesting Action might overinflate the category, it appeared that the subject's persistence in renaming the desired object or action was a consistent strategy to clarify what she wanted. Therefore, all occurrences (rather than just the first instance in a sequence) were scored.

The subject's use of Answering (the third-rated category overall) probably related more to the parent's than the child's behavior, in terms of the number of questions posed. Repeating, or imitation of the adult, on the other hand, has been hypothesized to play a wide variety of possible roles in the children's language learning (Snow, 1981). T.F. appeared to begin to expand the length of her utterances to two or more words in direct imitation of the parent's model. Some syntactic and morphological learning has been hypothesized to take place in
some children (those who are frequent repeaters) according to Bloom, Hood and Lightbown (1978). T.F., however, did not imitate as frequently as the children who showed significant syntactic expansion effects in Bloom, et. al.'s study. Rodgon and Kurder (1977) observed that imitation appeared to facilitate vocabulary acquisition. T.F.'s increased use of this category during the second seven-week time division may possibly have accompanied a period of rapid vocabulary growth. Also, T.F. may have used Repeating to stabilize her phonological productions of some words. Deferred imitations were not classified under Repeating in this study; the author used Ervin's (1964) and Ramer's (1976) criterion that the utterance immediately follow the modelled sentence.

Frequently, T.F. would repeat the adult utterance, and immediately self-repeat (these self-repetitions were classified under Practicing, since they had no identifiable communicative intent). Often, in this way, the subject produced several phonologically-variable versions of the same utterance. In the literature Practicing has been referred to as a solitary activity (Wood, 1976). Nevertheless, possibly because self-repetitions were included in the present categorization system, T.F.'s use of Practicing increased across time, even though she was in a situation in which she was receiving constant attention. She
appeared to use Practicing to vary productions of the same word, or to "play" with sounds. Interestingly, however, this sound play did not extend to any great degree to prosodic variation, with the exception of increased loudness (which, as will be discussed below, was a general trend in the majority of the pragmatic categories across time). Variability between children in terms of how much they use Practicing presumably exists, just as does children's use of imitation. Just as there is current controversy about the role of imitation in language learning, so too is the role of Practicing unclear. Halliday (1975), for instance, noted very little Practicing behavior in his son Nigel; whether this observation was due to the situations in which he observed his son (the majority of which appeared to be interactional) is not certain. In any case, T.F. appeared to enjoy "talking for its own sake," including varying her own productions, without any apparent need for an adult response.

Enjoying, unlike Practicing, was an interactional category. It was added to Dore's (1975) general pragmatic classification system by the author, because no other category appeared to include words or vocalizations expressive of shared pleasure. The use of Enjoying, which showed the second strongest average change across the three seven-week sessions (next to Practicing), declined (unlike Practicing, which increased) across time. It
appeared as though the subject gradually decreased her use of squeals, laughter, and even words of pleasure (e.g., "whee!") as a means of obtaining attention, once her linguistic strategies for establishing joint attention had become more refined. Although the category itself evidenced less use across time, T.F.'s linguistic expressions of this intent increased. Protesting, on the other hand, was used less frequently overall than Enjoying and showed less change across the three time divisions. Its slight increase during the second seven weeks could be related to the subject's having learned to use the linguistic expression of this intent (No!) more frequently.

Neither Greeting nor Calling were elicited frequently in this study, for obvious reasons. Greeting was elicited by having the subject's father walk in the room (without uttering a greeting himself, in order to elicit spontaneous greetings on the part of the subject, as opposed to an imitation). Generally only three opportunities per session were provided for elicitation of this category, and often the subject appeared to be so absorbed in play that she did not respond to her father's arrival; or so excited about what she was doing that she commented on her toy or activity (Labeling) rather than uttering the standard "Hi."

Finally, the category Other (Could Not Classify) occurred most often during the first seven weeks, perhaps because of less
consistent articulation on the part of the subject at that time, or because the subject's overall communication (including, possibly, gestures and/or facial expressions) was less well-defined. Since the videotapes were generally transcribed in the order they occurred, there is also the possibility that the author may have been more hesitant about coding utterances about which there was some doubt, or that she became increasingly skilled in interpreting T.F.'s intents with more practice. Given the reliability scores achieved by the author and another transcriber, however, this possibility appears less likely.

**Interaction Between Prosodic Variables and Pragmatic Categories**

As described in the Results, the data indicate a strong overall prosodic pattern which remained dominant across time, for all pragmatic categories except three (Protesting, Enjoying, and Requesting Action during the third seven weeks). The dominant pattern, it will be recalled, consisted of average pitch, rising-falling intonation, average loudness, and average tempo. Even when "strong trends" (greater than 10% change in use) occurred across time, no category was associated with a nondominant expression of intent more than 50% of the time, with the exception of the two categories which usually were expressed
through nonlinguistic expressions of intent (Protesting with crying, and Enjoying with laughter).

The prosodic classification system employed by the author was designed to insure reliability of measures, and did not reflect subtle nuances of pitch or intonation change. In other words, a high pitch was quite high, relative to the subject's average pitch (almost a falsetto), and all other patterns were based on definite contrasts. Even with theoretically "mutually exclusive" patterns, however, careful training was required in order to achieve the level of reliability reported here. Whether this difficulty reflects an orientation that deemphasizes the prosodic characteristics of speech as being of secondary importance (Crystal, 1979) or whether the interactional nature of prosodic variables (Crystal, 1979) makes clear distinctions difficult, is uncertain. Whatever the reason may be, this writer was unable to design a prosodic classification system that was more detailed yet which achieved acceptable reliability. Whether the strong dominant trends reported in this study will continue to be found in future studies in which classification systems may be more sensitive to prosodic change must be addressed in future research.

Since intonation is the prosodic element that has received the most attention in the research on child prosody (Crystal,
1979), and since it has the most-discussed relationship to different illocutionary acts (Crystal, 1979; Menyuk, 1977; Wood, 1976; Bates, et. al., 1975; Brown, 1973), it will be discussed first. Despite the fact that Menyuk and Bernholz (1969, cited in Menyuk, 1977) found that mothers and "objective listeners" (1975:44) could reliably classify children's intonational patterns as representing declaratives, emphatics, and questions, Menyuk herself recognized that there is little data to document what children themselves intend to communicate when they use different prosodic patterns. Additionally, there is little data at the one-word stage to document how consistently these different intonational patterns are used in relation to specific contextual situations or apparent pragmatic intentions (Crystal, 1979; Menyuk, 1977; Bloom, 1973). In other words, despite the apparent link between intonation and intentionality, there have been few studies on the consistency or frequency of use of particular intonational patterns to express intents in either children or adults.

**General Prosodic Trends**

The subject, T.F., used the rising-falling intonation predominantly throughout the three seven week sessions, and this use was particularly strong during the first two time periods,
when only two pragmatic categories used any category other than the rising-falling intonation more than 10% of the time. The exceptions were Protesting and Enjoying, which were dominated by crying and laughing, respectively. However, during the third seven weeks, the rising intonation to express the category, Requesting Action, increased from less than 2% (mean) use during the first two time periods, to 22.7% during the last seven sessions. Combined with a greater than 20% loudness increase for Requesting Action across the three time periods, the rising intonation pattern for Requesting Action demonstrated a relatively strong prosodic trend. This trend appeared to be indicative of the beginnings of prosodic contrastivity for this subject. Even despite a definite intonational trend during the last seven weeks, however, the subject was still using rising intonation to signal Requesting Action only approximately one-fourth of the time. In other words, the use of the rising-falling intonation remained dominant, although for the first time a strong secondary trend was emerging. Enjoying, too, exhibited stronger use of the rising intonation across time, although the trend was not as strong as for Requesting Action. Use of the rising intonation, which has frequently been associated with interrogative forms (Dore, 1976), underscores the need for more careful study of actual prosodic use in both
children and adults. The present data, then, provide little basis for the existence of intonational contrastivity (Bloom, 1973) during the one-word stage, although a relatively strong pattern emerged with regard to Requesting Action, particularly, during the last time division. Whether that pattern is common to other children, and whether it continues beyond the time boundaries imposed by the present study (as opposed to being an isolated phenomenon, as were some prosodic changes in this subject, which appeared for one of the seven-week time periods and then declined) will hopefully be addressed in future research. Possibly, the beginnings of prosodic contrastivity in this subject appeared in the prosodic category that was most related to the subject's strong motivation to secure parental attention. The concurrent increase in loudness with rising intonation to express Requesting Action, would appear to lend credence to this hypothesis. Perhaps the subject's urgency in procuring the desired parental behavior (wanting an object; wanting her mother's presence) may have accounted for the beginnings of a novel prosodic pattern: "Let's do something different to get Mom's attention!" As the author viewed the later videotapes, it was apparent that the combination of insistently repeating the name of the desired object (perhaps to clarify, since the subject's phonological productions were unstable),
gesturing, and using a different intonation and increased loudness was a different strategy indeed. Using a combination of strategies, the subject was often able to achieve possession of objects—or obtain parental actions—that she desired. Again, though, the rising intonation did not replace (or even seriously challenge) the dominant role of the rising-falling intonation.

Important as intonation appears to be with respect to expression of intent (at least in adults and older children), Crystal (1979:34) has maintained that other prosodic elements must also be examined carefully with relation to intentionality, particularly in the very young child:

Intonation is merely one factor in communicating meaning—as is clear when we consider what range of vocal characteristics enter into the definition of such tones of voice as sarcastic, angry, parenthetic, etc. Particularly during the first two years of life, nonintonational features (such as variations in loudness, duration, rhythmicality) are of considerable importance in the expression of meaning.

Tempo demonstrated the least variation of all the prosodic categories across time, although rapid utterances were used to express Protesting, Requesting Answer, Enjoying and Repeating (more than 10% of the time for any of the three time periods) from time to time. The trend toward a rapid (or short) utterance was the strongest for Protesting during the second time period,
when 40% of the subject's utterances utilized this tempo (probably, most often, for a staccato "No!"). During the third time period, however, crying reestablished itself as the dominant mode of expressing Protesting in this subject. Possibly, the changes in rate that one associates with excitement or strong affect in older children or adults do not begin to manifest themselves as strongly until the subject uses more multiword utterances. In the single-word stage, with so little encoded linguistically, the tendency to speed up under stress may not be as pressing. However, the use of rapid utterances to express Protesting, linguistically, appeared to foreshadow the reported later tendency to speed up under emotional duress (Dalton and Hardcastle, 1977).

Both overall pitch and loudness showed greater variability in prosodic use than did tempo, and both demonstrated general trends across time. T.F., for instance, used the high pitch less frequently across time. The only category associated with high pitch more than 10% of the time by the last seven weeks of the study was Enjoying (indicative of this pragmatic category's relatively great diversity prosodically, compared to the other categories). T.F.'s increased use of the high pitch in conjunction with expressions of Requesting Answer (during the second time period only) may have been a step toward her eventual
use of the rising intonation to encode this intent during the last seven weeks of the study (in other words, she may have initially used a high pitch, followed by a transition to rising intonation, to encode this particular intent). As already mentioned, with the exception of Enjoying (13.8; 18.2; 24.1) no category reflected a strong trend toward increased use of the high pitch; in the majority of categories, the high pitch declined across time or remained at 0% use, while the use of the average pitch strengthened.

How is one to explain the seeming abandonment of prosodic diversity across time with respect to pitch? One possibility is that high pitch was not used contrastively as an expression of specific intents (except perhaps concomitant with general excitement, as witness its increasing strength with relation to the category, Enjoying). Rather, high pitch may have initially been used as a strategy for maintaining joint attention before the subject's linguistic resources became more sophisticated. Just as use of the pragmatic category Enjoying, declined across time, so too did use of the high pitch decrease: As the subject became more involved in true linguistic interactions as time went on, and more able to code her utterances linguistically, the use of "excitement" (high-pitched or squealing) tones to maintain dialogue may have become less needed. Perhaps, also, other
nonlinguistic strategies (such as the apparent use of contrastive intonation to request action, as time went on), may have served to take the place of high pitch when the parent's immediate attention was most desired.

While use of the high pitch declined, T.F.'s general use of louder speech across time increased. Seven of the eleven pragmatic categories demonstrated this trend. T.F. also used loud speech to express the category Protesting almost 30% of the time during the second seven weeks, the time when linguistic expression of this intent was strongest. In addition, while the cries of the subject were not analyzed prosodically, many of them would probably have been classified as "loud." Requesting Answer, which was associated with a trend toward soft speech, was only infrequently elicited during the last seven weeks.

Whether the use of the louder voice by this subject across time represented a general strategy or was an expression of pragmatic contrastivity is a question which has several possible answers. Many of the categories which demonstrated increased loudness across time showed little additional deviance from the dominant trends in the other prosodic areas. Therefore, increased volume across time appeared to be indicative of an overall trend—perhaps the subject may have been playing with increased volume for its own sake, or more likely was using
louder speech as a general strategy for securing parental attention. The only categories, however, which demonstrated greater than 20% use of loud speech were Requesting Answer and Protesting during the second seven weeks, and Requesting Action during the final time period. For these categories, perhaps, some specific prosodic/intentional contrastivity was emerging. Again, those categories in which the greatest loudness emerged appeared to be those in which the subject may have been most motivated to achieve immediate parental attention in order to achieve a desired end.

In summary, the author concurs with Crystal's view, emphasized in his 1979 summary of current knowledge about the child's developing prosody, that "situational interpretations cannot be taken at face value" (1979:33). T.F. did make stronger use of the nondominant prosodic features to express some intents (particularly Requesting Action, Protesting, and Enjoying) as opposed to others. However, there are few data in the present study which indicate consistent prosodic differentiation of specific pragmatic categories by this subject during the one-word stage. Whether the author's prosodic categories may have been too broad to capture subtle nuances of expression remains to be addressed in future studies.

Prosody was not consistently associated with specific
intentions, and yet the author and an independent observer were able to reliably encode pragmatic use. Therefore, the question remains what additional strategies children may use to effectively communicate their intentions. Perhaps the context provides clues to interpretation, as may gestures and facial expressions. Menyuk (1977) suggested that gestures may be used differentially prior to prosodic contrasts. Ingram (1971) has proposed that gestures and context be viewed as formal grammatical categories for children at this age. While Ingram's view may be extreme, the visual aspects of the interaction appeared to be valuable in terms of reliably encoding the subject's pragmatic intents; the author found that coding the home audio-tapes was much more difficult. She relied on the mother's responses to T.F.'s utterances much more on the home tapes to encode the pragmatic categories.

The apparent prosodic differentiation which began to emerge toward the end of the study, with relation to some of the pragmatic categories, moreover, did not consistently match the adult concepts of "question" versus "statement." Why did the subject begin to use the rising inflection for Requesting Action, but not for Requesting Answer, can only be hypothesized. This subject appeared to be learning the general prosodic pattern (particularly with regard to intonation and tempo) of the adult
language during the one-word stage. The rising-falling intonation contour described in this study appears to parallel the tonic stress and subsequent falling-off of the tone at the end of the adult declarative utterances (Crystal, 1979; Menyuk, 1977; Dalton and Hardcastle, 1977; Lieberman, 1967; Lenneberg, 1967). Perhaps later, as more words are incorporated into the tone-unit, and as the children develop skills to affectively and cognitively differentiate their own intentions more clearly, deviations from the dominant pattern may occur more frequently.

Having observed the subject for just over a year at the onset of the study, and having read in numerous sources that prosodic variations may be the first contrasts to be learned by the child and expressed verbally or vocally (Halliday, 1975; Waterson, 1971), the present data were both surprising and puzzling in reflecting this subject's lack of prosodic variety. Once again, although subtle variations in tone of voice and intonation may not have been captured under the present classification system, one is faced with trying to resolve what has been generally reported in the literature (with the exception of such investigators as Crystal, 1979; Scollon, 1976; and Bloom, 1973) with the findings of the present study. There may be a parallel between the development of prosodic and segmental speech characteristics: While the child may babble all the
sounds of his language, and other languages as well, as a rule he will not be able to incorporate them into his linguistic sound system (Lenneberg, 1967). Similarly, children may go through a period of babbling and/or jargon that is relatively rich prosodically; but when words are learned, there may be a stabilization of the dominant prosodic pattern (the one most often heard by the child in adult speech) before greater differentiation takes place.

To generalize to other children from the data collected in the present study with regard to a single subject would be premature, to say the least. However, others (Scollon, 1976; Bloom, 1973) have reached the same general conclusions from their studies with single subjects. Halliday (1975), for instance, has speculated that there may be "word babies" and "intonation babies". This subject, T.F., would probably be included in the former group on the basis of her tendency to label objects, her disinclination to use babbling or jargon once she began to learn words (as was reflected in the decline of the Enjoying category), and her definite preference for a single prosodic pattern throughout the period under study. Whether Halliday's hypothesis is based in fact—whether there really are two (or more) sorts of children with respect to prosodic development, or whether patterns are more universal—is a question that awaits a more
conclusive data base. Whether the patterns of prosody of this subject are idiosyncratic or universal, the data indicate the fallacy of assuming consistent prosodic contrast at the one-word stage. As Bloom has argued (1973), the child's concept or expression of meaning at this stage may not have developed into the well-established system of illocutionary acts the adult infers during this stage of development.

Limitations of the Present Study

As previously mentioned, one possible limitation of the current study was that the prosodic categories may not have been sensitive enough to subtle shades of meaning in the child's utterances. Future researchers will have to balance the benefits of obtaining reasonable reliability with the possible benefits of a more detailed prosodic transcription system. If studies are neither repeatable nor reliable, however, one must question their conclusions. A problem with many of the studies reviewed by this writer is that they stated "obvious" truths about prosody and intentionality, but failed to share the data upon which the conclusions were apparently based.

Secondly, because of the large amount of data collected, an in-depth analysis of the author and subject's interpersonal interactions (including gestures) was not attempted. Perhaps
future studies will reveal more about the frequency of particular pragmatic categories or prosodic patterns in relation to specific parental behaviors, including modeling.

The present study may be difficult to replicate because of its lack of rigid structure, or of set numbers of elicitation behaviors. However, the purpose of the study was to provide a detailed account of prosodic usage in a single subject in one specific play situation. Had the author established more rigid elicitation procedures, or a standard play sequence from session, a threat to the study's variability may have resulted: The inapplicability of the results to everyday interactions. Although the study remains limited by some of the considerations discussed above, its conclusions are still based on more reported data than are many in the current literature.

Directions for Future Research

Ferguson and Farwell (1975) commented on the need for more in-depth studies of the phonology of single subjects. Their philosophy appears to be equally applicable to other areas of language acquisition. Specifically, there appears to be a need for more longitudinal studies on individual subjects documenting prosodic use over time, pragmatic use over time, and their interaction, so that eventually the variability and/or
consistency between children may be assessed. A combination of diary accounts, augmented by periodic videotaping sessions in a setting in which the subject appears to feel comfortable, would appear to be a workable design for such a study. Perhaps had the author supplemented her videotapes with a diary account of T.F.'s behavior, more understanding of her prosodic and pragmatic behavior could have been gained.

Second, there remains a pressing need to redefine and explore relative use among pragmatic categories from the time children's intentions can be reliably discerned. Dale's (1980) system of pragmatic classification is a promising approach; a more ambitious (but much needed) project would be to outline pragmatic use and change (including a categorization system or systems that can be reliably implemented) across time. One senses from the current summaries of the pragmatics literature (i.e., Chapman, 1981) that little has been done to bridge pragmatic systems at different age levels.

Third, the development of a reliable yet sensitive "prosodic notation" system (Halliday, 1975: 13) is needed. Crystal's statement that prosodic characteristics of utterances are regarded as an afterthought to segmental analysis is unfortunately accurate. Given the recent emphasis (Ingram, 1971) on the importance of nonverbal information in conveying
communicative intent, this emphasis on the linguistic aspects of communication should be balanced with nonverbal (including prosodic) analysis systems which are sensitive but not overly cumbersome.

Finally, Crystal (1979) has emphasized that, as little as is known with regard to prosodic development in early childhood, still less is known about prosodic use and change in older children. He commented:

Once grammatical patterns and lexical sets develop, then the tracing of prosodic patterns becomes a much more straightforward task. What is important here is to remember the important role prosody has in relation to the delimitation and integration of such structures as relative clauses, coordination, adverbial positioning, direct/indirect object marking, and the like...Very little research seems to have been done on the later development of such patterns, but it is probably that this kind of learning continues until puberty (and in terms of development of one's stylistic control over prosody, e.g. in dramatic speaking, into adult life). [italics supplied] (1979:47).

While Crystal emphasized prosodic contrastivity with relation to specific structures, one could equally well study prosodic patterns in the context of specific functional intents (including more "adult" forms of humor, sarcasm, anger, etc.). This writer plans to continue studying T.F.'s prosody until she reaches puberty.
In summary, an awesome amount of knowledge remains lacking in the area of prosodic development and its interaction with intentionality in both children and adults. One hopes that many more studies will be conducted with both individuals and groups to chart the functional development of prosody. The knowledge gained thereby may help communicologists to better understand both normal development and disorders of prosody (i.e., stuttering). The author believes that this study has increased current knowledge through its description of a single subject at the one-word stage. Findings in relation to each research question are discussed below.

Conclusion

The author's investigation into the pragmatic and prosodic development of the subject resulted in the following conclusions:

1. **Pragmatic Use/Change Across Time:** While some patterns were used more than others, average use of specific categories was reasonably consistent across the three time divisions. Labeling, Requesting Action, and Answering were the three most frequent categories across time; Practicing (which increased) and Enjoying (which decreased) demonstrated the greatest change across the three seven week periods.

2. **Prosodic/Pragmatic Interaction:** This subject
demonstrated a dominant prosodic pattern consisting of average pitch, rising-falling intonation, average loudness, and average tempo for all but three pragmatic categories: Enjoying, Protesting, and Requesting Answer (during the last seven weeks of the study). The subject appeared to use greater prosodic contrast with regard to intentional utterances with which she attempted to secure immediate parental attention. Nonetheless, there is little evidence to suggest consistent use of any nondominant prosodic elements to contrast either pragmatic categories or illocutionary acts at this stage of development.

3. Prosodic Use: The subject appeared to be stabilizing the use of the dominant prosodic elements across time (with the exception of loudness, which demonstrated slightly more variety). The intonational pattern used by the subject appeared to resemble the most often-used (declarative) contour of the adult. The beginnings of prosodic differentiation were emerging toward the end of the study, although there was still no consistent contrastive use at that time.

The findings of the present study concur with Crystal's (1979), Bloom's (1973) and Scollon's (1976) conclusion that there is little empirical evidence for consistent prosodic differentiation of intents at the one-word stage.
REFERENCES


APPENDIX A.

DEFINITIONS AND DESCRIPTIONS OF PRAGMATICS

Definitions:


Bruner (1974/75: 283): the "directive function of speech through which speakers affect the behavior of others in trying to carry out their intentions."

McLean and Snyder-McLean (1978: 48): "...the study of commun-functions realized through language."

Descriptions:

De Laguna (1927: 20): "Men do not speak simply to relieve their feelings or air their views, but to awaken a response in their fellows and to influence their attitudes and acts."

Bruner (1975: 20): "Language is acquired as an instrument for regulating joint activity and joint attention."

Chapman (1981: 112): "One branch of work in pragmatics is devoted to the analysis of speakers' communicative intents: the reason why people talk. The categories developed are diverse, depending on the author's purpose, data, and philosophical point of view."
## APPENDIX B.

### SUMMARY OF SELECTED STUDIES WHICH INFERENCE A RELATIONSHIP BETWEEN PROSODY AND INTENT

<table>
<thead>
<tr>
<th>Author, Year</th>
<th>General Conclusion</th>
<th>Data Base</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tonkova Yampolskaya, 1973</td>
<td>Correlated enjoyment sounds, comfort vs. discomfort sounds, and anger sounds of infants with adult use of these prosodic patterns.</td>
<td>Sound intonograms were recorded on 170 infants (30 between 0 and 6 months old).</td>
</tr>
<tr>
<td>Dore, 1974.</td>
<td>Infers that one-word utterances can be differentiated contrastively by prosody.</td>
<td>Cites examples from other studies, but his own data base is unclear.</td>
</tr>
<tr>
<td>Dore et. al., 1976.</td>
<td>Concluded that children acquire syntagmas rather than formal grammatical categories at this stage.</td>
<td>Apparently the research was conducted on several subjects; results from only 2 subjects (3 observations) reported.</td>
</tr>
<tr>
<td>Halliday, 1975.</td>
<td>Transcribed his son Nigel's intonation patterns in detail, and concluded that at around 19 months Nigil produced &quot;pragmatic&quot; versus &quot;mathematic&quot; utterances contrastively, with a rising and falling tone, respectively.</td>
<td>One subject.</td>
</tr>
<tr>
<td>Bloom, et. al., 1978.</td>
<td>Gives examples that integrate different tones of voice in both cries and vocalization with children's apparent intentions in communicating.</td>
<td>Data reported on 3 subjects.</td>
</tr>
</tbody>
</table>
### APPENDIX C.

**RELIABILITY MEASURES OF SELECTED STUDIES ON CHILDREN FROM THE PRELINGUISTIC STAGE TO 2;0**

<table>
<thead>
<tr>
<th>Author, Year</th>
<th>Procedure</th>
<th>Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tonkova Yampolskaya, 1973</td>
<td>Used spectrographic information to determine if prosodic contours were related to affective states.</td>
<td>Intonograms: Used only those which exceeded a probability of 95 on the Weber table. Judgements of Affect (made by parents, nursery attendants, etc.): no reliability reported.</td>
</tr>
<tr>
<td>Bloom, 1970.</td>
<td>Described the emerging language of 3 children, for 8 hours of audiotaped samples per child; recorded between 3-6 of these samples per child.</td>
<td>Samples transcribed by 2 separate recorders; reliability achieved by consensus; no intrajudge reliability reported.</td>
</tr>
<tr>
<td>Bloom, 1973.</td>
<td>Described her daughter Allison's language development at the one-word stage through diary entries and 4 videotape sessions, 40 minutes in length.</td>
<td>Said that transcription/reliability procedures were similar to her 1970 study.</td>
</tr>
<tr>
<td>Halliday, 1975.</td>
<td>Halliday transcribed his son Nigel's speech, apparently on-line, from 0;9 to 2;0.</td>
<td>No reliability reported.</td>
</tr>
<tr>
<td>Dore et. al., 1976.</td>
<td>Described children's transisional stage between one- and two-word utterances; data reported on 3 children.</td>
<td>No reliability reported.</td>
</tr>
<tr>
<td>Dale, 1980.</td>
<td>Discussed the reliable encoding of children's utterances pragmatically.</td>
<td>Interjudge reliability generally greater than 80%; no intra-judge reliability reported.</td>
</tr>
</tbody>
</table>
APPENDIX: D.

CRYSTAL'S PROPOSED SEQUENCE OF PROSODIC DEVELOPMENT

(i) Initially, the child uses only falling patterns. Menn states that—except for imitations of adult rises—her child used rises on words only after these words were used with falls (1976 a: p. 195). Halliday's range contrasts are all on falling tones.

(ii) The first contrast is falling versus level tones (high level in Halliday (1975: pp. 150-1), the level tone often being accompanied by other prosodic features, e.g., falsetto, length, loudness variations.

(iii) This is followed by falling versus high rising tones, the latter being used in a variety of contexts. Menn's special study of rising tones brought to light a large number of contexts including offering, requesting, attention-getting, and several 'curiosity' noises (e.g., 'request' includes requests for help, recognition, permission, to obtain an object, etc., all of which are distinguishable in the situation (1976 a: pp. 186ff, 198-9). The 'natural' distinction between fall and rise is characterized as 'demanding' versus 'requesting/offering' (p. 193). Halliday's high rises are first used in association with falls, as compound tones (1975: p. 151).

(iv) The next contrast is between falling and high falling tones, the latter especially in contexts of surprise, recognition, insistence, greeting. Halliday reports a high falling contrast between 1;1 and 1;3, and further distinguishes a mid fall.

(v) A contrast between rising and high rising tones follows: the Reading study suggested a particular instance of high rises particularly in playful, anticipatory contexts. Menn notes the latter mainly in 'intensification' contexts: the child gets no response to an utterance with a low rise, and repeats the utterance with a wider contour—the extra height, according to Menn, is the 'essential information-carrying feature' (1976a, pp. 193-194). Halliday's mid versus high rise emerges at 1;3 to 1;4.

(vi) The next contrast is between falling and high rising-falling tones, the latter being used in emphatic contexts, e.g. of achievement (e.g. there, as an extra brick is being placed on a pile) or impressiveness (e.g. bûs vs. bûs, the former being

(continued on next page)
used by one child studied to refer to 'any' vehicle, the latter to a real bus). Menn reports a mid-high-low contour at 1;4; Halliday has a similar contrast from as early as 1;1, but regularly from 1;3.

(vii) Next appears a contrast between rising and falling-rising tones, the latter especially in warning contexts, presumably reflecting the be careful pattern common in adults; cf. Halliday (1975: p. 154), between 1;4 and 1;6.

(viii) Among later contrasts to appear is that between high and low rising-falling tones, especially in play contexts.

Source: Crystal, 1979: 42-43
# APPENDIX E

## DORE’s PRIMITIVE SPEECH ACTS

<table>
<thead>
<tr>
<th>Speech act</th>
<th>Definition</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labeling</td>
<td>Uses word while attending to object or event. Does not address adult or wait for a response.</td>
<td>C touches a doll’s eyes and says eyes.</td>
</tr>
<tr>
<td>Repeating</td>
<td>Repeats part or all of prior adult utterance. Does not wait for a response.</td>
<td>C overhears Mother’s utterance of doctor and says doctor.</td>
</tr>
<tr>
<td>Answering</td>
<td>Answers adult’s question. Addresses adult.</td>
<td>Mother points to a picture of a dog and asks What’s that? C answers bow-wow.</td>
</tr>
<tr>
<td>Requesting action</td>
<td>Word or vocalization often accompanied by gesture signaling demand. Addresses adult and awaits response.</td>
<td>C, unable to push a peg through hole, utters uh uh uh while looking at Mother.</td>
</tr>
<tr>
<td>Calling</td>
<td>Calls adult’s name loudly and awaits response.</td>
<td>C shouts mama to his mother across the room.</td>
</tr>
<tr>
<td>Greeting</td>
<td>Greets adult or object upon its appearance.</td>
<td>C says hi when teacher enters room.</td>
</tr>
<tr>
<td>Protesting</td>
<td>Resists adult’s action with word or cry. Addresses adult.</td>
<td>C, when his mother attempts to put on his shoe, utters an extended scream of varying contours while resisting her.</td>
</tr>
<tr>
<td>Practicing</td>
<td>Use of word or prosodic pattern in absence of any specific object or event. Does not address adult. Does not await response.</td>
<td>C utters Daddy when he is not present.</td>
</tr>
</tbody>
</table>

*Source: Adapted from Tables 1 and 2 of Dore, 1975 Reprinted from Miller, 1981: 117*
### APPENDIX F.

**HALLIDAY'S DESCRIPTION OF FUNCTIONS IN NIGEL'S SPEECH**

(9 to 12 months old)

<table>
<thead>
<tr>
<th>Function and example</th>
<th>Vocalization</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Instrumental</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generalized request for object</td>
<td>/na/roffienfe/</td>
<td>Generalized request for object</td>
</tr>
<tr>
<td>Request for specific object</td>
<td>/bdr/ = Give me that bird.</td>
<td>Request for specific object</td>
</tr>
<tr>
<td>Rejection of object</td>
<td>light touch of object = I don't want that.</td>
<td>Rejection of object</td>
</tr>
<tr>
<td><strong>Regulatory</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General request for action</td>
<td>/al/ = Do that again.</td>
<td>General request for action</td>
</tr>
<tr>
<td><strong>Interactional</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vocalization upon appearance of person</td>
<td>/'d/x = Nice to see you. Shall we look at this together?</td>
<td>Vocalization upon appearance of person</td>
</tr>
<tr>
<td>Vocalization in response to other's vocalization</td>
<td>/'a/x = Yes it's me.</td>
<td>Vocalization in response to other's vocalization</td>
</tr>
<tr>
<td>Vocalization in response to gift</td>
<td>/'x/x = What's that?</td>
<td>Vocalization in response to gift</td>
</tr>
<tr>
<td>Vocalization in response to regulation</td>
<td>/'a/x = (loudly) yes?</td>
<td>Vocalization in response to regulation</td>
</tr>
<tr>
<td><strong>Personal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Interest in participation</td>
<td>/'d/x = Look, that's interesting.</td>
<td>General Interest in participation</td>
</tr>
<tr>
<td>Comment on objects</td>
<td>/'d/x = dog</td>
<td>Comment on objects</td>
</tr>
<tr>
<td>Expression of pleasure</td>
<td>/'x/x = That tastes nice.</td>
<td>Expression of pleasure</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>/'x/x = I'm sleepy.</td>
<td>Withdrawal</td>
</tr>
</tbody>
</table>


Source: Halliday, 1975

Reprinted from Miller, 1981: 114

(continued on next page)
### APPENDIX F., continued

**HALLIDAY’S DESCRIPTION OF FUNCTIONS IN NIGEL’S SPEECH**

**(16 to 18 months old)**

<table>
<thead>
<tr>
<th>Function and example</th>
<th>Vocalization</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Instrumental</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generalized request for object</td>
<td><em>lm</em></td>
<td>Give me that.</td>
</tr>
<tr>
<td>Request for food</td>
<td><em>more</em></td>
<td>I want some more.</td>
</tr>
<tr>
<td>cake</td>
<td><em>ball</em></td>
<td>I want my ball.</td>
</tr>
<tr>
<td>Dvořák</td>
<td><em>fish</em></td>
<td>I want to be lifted up to where the fish picture is.</td>
</tr>
<tr>
<td>Request for specific objects or entertainment</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>cake</em></td>
<td></td>
<td>I want some cake.</td>
</tr>
<tr>
<td><em>ball</em></td>
<td></td>
<td>I want my ball.</td>
</tr>
<tr>
<td><em>Dvořák</em></td>
<td></td>
<td>I want the Dvořák record on.</td>
</tr>
<tr>
<td><strong>Regulatory</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General request for action</td>
<td><em>ld</em></td>
<td>Do that (again).</td>
</tr>
<tr>
<td>Specific requests for activity</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>lunch</em></td>
<td></td>
<td>Come for lunch.</td>
</tr>
<tr>
<td><em>stick-hole</em></td>
<td></td>
<td>Can I put my stick in that hole?</td>
</tr>
<tr>
<td><em>ld</em></td>
<td></td>
<td>Pick me up (gestures).</td>
</tr>
<tr>
<td>Request for permission</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Request for assistance</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Interactional</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greeting person</td>
<td><em>lá louá</em></td>
<td>hello</td>
</tr>
<tr>
<td>Seeking person</td>
<td><em>Anna</em></td>
<td>Where are you?</td>
</tr>
<tr>
<td>Finding person</td>
<td><em>Anna</em></td>
<td>There you are.</td>
</tr>
<tr>
<td><em>devil</em></td>
<td></td>
<td>You say, “ooh you are a devil.”</td>
</tr>
<tr>
<td><em>Paj</em></td>
<td></td>
<td>Let’s be sad, it’s broke.</td>
</tr>
<tr>
<td><em>lm</em></td>
<td></td>
<td>Yes, I see.</td>
</tr>
<tr>
<td><em>ld</em></td>
<td></td>
<td>There is it.</td>
</tr>
<tr>
<td><strong>Personal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comment on appearance of object</td>
<td><em>star</em></td>
<td>There’s a star.</td>
</tr>
<tr>
<td>Comment on disappearance</td>
<td><em>no more</em></td>
<td>The star has gone.</td>
</tr>
<tr>
<td>Express feelings of:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>interest</td>
<td><em>ld</em></td>
<td>That’s interesting.</td>
</tr>
<tr>
<td>pleasure</td>
<td><em>layd</em></td>
<td>That’s nice.</td>
</tr>
<tr>
<td><em>ld</em></td>
<td></td>
<td>That’s funny.</td>
</tr>
<tr>
<td>surprise</td>
<td><em>lm</em></td>
<td>Look at that.</td>
</tr>
<tr>
<td>excitement</td>
<td><em>ld</em></td>
<td>That’s my ______.</td>
</tr>
<tr>
<td>ritual joy</td>
<td><em>Jv</em></td>
<td>Careful, it’s sharp.</td>
</tr>
<tr>
<td>warning</td>
<td><em>jchel</em></td>
<td>I’m fed up.</td>
</tr>
<tr>
<td>complaint</td>
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<td></td>
</tr>
<tr>
<td><strong>Heuristic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Request for information</td>
<td><em>ls</em></td>
<td>What’s that called?</td>
</tr>
<tr>
<td>Acknowledgment</td>
<td><em>lm</em></td>
<td>I see.</td>
</tr>
<tr>
<td>Imitating</td>
<td>(imitates name)</td>
<td>it’s a</td>
</tr>
<tr>
<td><strong>Imaginative</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretend play</td>
<td><em>g</em></td>
<td>Let’s pretend to go to sleep.</td>
</tr>
<tr>
<td><em>Já, có</em></td>
<td></td>
<td>Roar, let’s pretend to be a lion.</td>
</tr>
<tr>
<td>Jingles</td>
<td><em>cockadoodledo</em></td>
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</tr>
<tr>
<td>Rhymes</td>
<td>(supplies final word)</td>
<td></td>
</tr>
</tbody>
</table>

**Source:** Halliday, 1975: 156–157; reprinted from Miller, 1981: 115

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### APPENDIX C.
OPERATIONALLY-DEFINED PRAGMATIC CATEGORIES MODIFIED FROM DORE, 1975

<table>
<thead>
<tr>
<th>Primitive Speech Act</th>
<th>Utterance</th>
<th>Antecedent</th>
<th>Behavior</th>
<th>Response</th>
<th>Contextual Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Labeling</td>
<td>Word PCF Presyntactic device</td>
<td>object or event is attended to by child</td>
<td>child may or may not address adult as he labels; may or may not gesture</td>
<td>adult/partner may or may not respond (repeating, otherwise reinforcing, or correcting)</td>
<td>Salient feature focused on by child—no change in situation except possible adult attention.</td>
</tr>
<tr>
<td>2. Repeating</td>
<td>Word Prosodic pattern PCF Presyntactic device</td>
<td>child attends to adult utterance</td>
<td>child may/may not address adult as he repeats; may/may not gesture if referent known.</td>
<td>same as above</td>
<td>Utterance focused on by child; no change in situation</td>
</tr>
<tr>
<td>3. Requesting Action</td>
<td>Word Marked prosodic pattern PCF Presyntactic device</td>
<td>attends to object or event</td>
<td>child addresses adult, awaits response, usually gestures</td>
<td>may or may not perform action, which may or may not cause child to repeat cycle or give up</td>
<td>Salient feature focused on by child or adult; often change in condition of object or child</td>
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<tr>
<td>4. Requesting Answer</td>
<td>Word PCF Prosodic pattern</td>
<td>attends to object</td>
<td>addresses adult; awaits response; may gesture regarding object</td>
<td>usually responds</td>
<td>No change in situation</td>
</tr>
<tr>
<td>5. Answering</td>
<td>Word PCF</td>
<td>attends to adult utterance and/or object, situation</td>
<td>addresses adult</td>
<td>waits for child to respond; usually acknowledges response; may perform response prompts adult action</td>
<td>Utterance focused on; usually no change in situation unless child's action</td>
</tr>
</tbody>
</table>

(continued on next page)
### Primitive Speech Utterance

<table>
<thead>
<tr>
<th>Act</th>
<th>Utterance</th>
<th>Antecedent</th>
<th>Behavior</th>
<th>Response</th>
<th>Contextual Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Calling</td>
<td>Word PCF</td>
<td>attends to adults presence or absence</td>
<td>addresses adult by uttering name loudly or indicating desire for proximity; waits for response</td>
<td>usually attends to or answers child; may sometimes ignore</td>
<td>usually, adults orientation to/ distance from child changes</td>
</tr>
<tr>
<td>7. Greeting (Farewell)</td>
<td>Word PCF Prosodic pattern</td>
<td>attends to person or object</td>
<td>acknowledges presence verbally</td>
<td>usually returns greeting</td>
<td>speech event initiated/ended</td>
</tr>
<tr>
<td>8. Protesting</td>
<td>Word Cry Marked prosodic pattern</td>
<td>attends to adult or contextual situation</td>
<td>resists or denies situation or adult action</td>
<td>adult may change situation or own response; or may fail to make desired changes</td>
<td>often situation changes</td>
</tr>
<tr>
<td>9. Practicing</td>
<td>Word Prosodic pattern</td>
<td>may or may not use present object or event as cue</td>
<td>does not address adult; verbalizes &quot;for its own sake&quot;</td>
<td>usually none</td>
<td>child is verbalizing for own sake rather than in dialogue; includes self-repetitions</td>
</tr>
<tr>
<td>10. Enjoying</td>
<td>Word, PCF, PSD, or prosodic contour</td>
<td>event occurs or object seen which child enjoys</td>
<td>child comments on enjoyment (often accompanied by gestures or other expansive physical movements)</td>
<td>usually shared excitement (verbal or nonverbal) or pleasure</td>
<td>often occurs in context of physical closeness or active play</td>
</tr>
<tr>
<td>11. Other (CNC)</td>
<td>utterances unclassifiable or did not fit into above categories</td>
<td></td>
<td></td>
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</tbody>
</table>

**Source:** Categories 1-9 are derived from Dore, 1975
Categories 10 and 11 added by the author
APPENDIX H.

PROSODIC CATEGORIES USED FOR CLASSIFICATION OF THE
SUBJECT'S UTTERANCES

**Pitch A** *(general pitch level)*

1 = High  
2 = Average  
3 = Low  
4 = Not Applicable (as in whisper)  
5 = Variable

**Pitch B** *(intonation, or direction of pitch change)*

1 = Rising  
2 = Falling  
3 = Level  
4 = Rising-Falling  
5 = Other

**Loudness**

1 = Loud  
2 = Average  
3 = Soft  
4 = Variable

**Tempo**

1 = Short (rapid) single-syllable utterance  
2 = Average single-syllable utterance  
3 = Long (slow) single-syllable utterance
Tempo (continued)

4 = Fast multiple-syllable utterance
5 = Average multiple-syllable utterance
6 = Slow multiple-syllable utterance
7 = Variable multiple-syllable utterance
APPENDIX I.

DEVELOPMENTAL INFORMATION REGARDING THE SUBJECT, T.F. AND THE ITEM'S RELATION TO NORMATIVE DEVELOPMENTAL SCALES

<table>
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<tr>
<th>Behavior</th>
<th>Age of Occurrence</th>
<th>Scale/Projected Age</th>
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<tbody>
<tr>
<td>Smiled with Eye Contact</td>
<td>4 weeks</td>
<td>Denver: 0; 3</td>
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<tr>
<td>Grasped a rattle</td>
<td>0; 2.28</td>
<td>Denver: 0; 3</td>
</tr>
<tr>
<td>Turned over (one way)</td>
<td>0; 3.08</td>
<td>Denver: 0; 4</td>
</tr>
<tr>
<td>Crawl (on hands and knees)</td>
<td>0; 5.07</td>
<td>(not on scales)</td>
</tr>
<tr>
<td>Stood (hanging on to furniture)</td>
<td>0; 6.02</td>
<td>Denver: 0; 7</td>
</tr>
<tr>
<td>Stood (alone)</td>
<td>0; 7</td>
<td>Denver: 0; 11</td>
</tr>
<tr>
<td>Walked unassisted</td>
<td>0; 9</td>
<td>Boyd: 1; 0</td>
</tr>
<tr>
<td>First &quot;true&quot; word (other than mama, dada)</td>
<td>0; 9</td>
<td>Boyd: 1; 0</td>
</tr>
<tr>
<td>First two-word utterance (within single prosodic contour)</td>
<td>1; 1</td>
<td>Denver: 1; 8</td>
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<tr>
<td>MLU at end of current study: 1; 6</td>
<td></td>
<td>Miller and Chapman, 1979</td>
</tr>
</tbody>
</table>

Source: Written diary accounts kept by the subject's parents.

Miller and Chapman, 1979
APPENDIX J.

ELICITATION MODES FOR PRAGMATIC CATEGORIES

1) Labeling: Objects which have previously been named by Teal (i.e., items within her current lexicon) shall be placed in front of her. If the subject does not respond spontaneously, pointing (but no verbal questioning) may be used to stimulate naming of the picture or object.

2) Repeating: While looking at books or toys, the parent will name objects. These may be items within Teal’s spontaneous lexicon, or those previously imitated. Teal will be given the opportunity to repeat. The visual cue will also be present, and pointing and/or some gesturing may be employed along with the auditory cue.

3) Requesting Action: A cookie, novel toy, or some other object the subject has demonstrated interest in will be placed out of reach, so that Teal must employ the adult as agent.

4) Requesting Answer: Unfamiliar pictures or objects will be placed in front of Teal, in order to stimulate her asking their names.

5) Answering: The parent will point to an object (the name of which is currently in Teal’s lexicon) and ask, "What's that?" or (for instance, in the case of a sound) "What does the chick say?"

6) Calling: The parent will go to the opposite side of the room and turn her back on Teal during the course of an already established social interaction and turn her back on her for at least 10 seconds.

7) Greeting: Teal's father will periodically enter and leave the taping room. No verbal cues will be given. Waving may be used to stimulate the subject's verbalization.

8) Protesting: Teal's diaper may be changed, a toy with which she is playing taken away, or the word "no" uttered sharply (on occasions when this might normally be done at home). Other options include: Washing the face or ears, picking the subject up once happily situated, or other actions which are expected to be noxious to the subject.

(continued on following page)
9) Practicing: When Teal is absorbed in an activity, the parent may withdraw to see if any spontaneous, noninteractive verbalizing takes place.

10) Enjoying: The parent may tickle, nuzzle, run, play active games, chase, play peek-a-boo, etc., along with making exaggerated "excitement noises" (marked prosodic patterns, "sound effects," etc.). The context will be active play, or physical closeness.
APPENDIX K

GENERAL STYLE OF INTERACTION

1) When Teal takes the lead in establishing joint attention, the parent will frequently follow her line of regard and comment on her actions/verbalizations.

2) In commenting, the parent will employ generally simple sentences, repetitions of Teal's words and sounds, some exaggeration of intonation contours, stress on salient words, and physical gestures.

3) The parent will also initiate action/verbalization sequences, and will occasionally take the lead in focusing joint activity and attention.

4) The parent will occasionally initiate common games/rituals used in the home.

5) To facilitate the above, both familiar objects and unfamiliar objects will be provided. Feeding activities, changing diapers, etc. will also sometimes be employed to stimulate verbalizations.

6) The interactions will employ physical closeness, reprimands, and verbal reinforcement in a pattern as close as possible to that in the home.

7) Some opportunities will be provided in each taping session for the subject to play alone or more independently.
## SCHEDULE OF TAPING SESSIONS FOR THE PRESENT STUDY

<table>
<thead>
<tr>
<th>Session Number/Utterances</th>
<th>Date</th>
<th>Audiotaped*</th>
<th>Videotaped</th>
</tr>
</thead>
<tbody>
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<td>1: 122</td>
<td>July 2, 1981</td>
<td>X</td>
<td>X</td>
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<tr>
<td>2: 149</td>
<td>July 7, 1981</td>
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<td>3: 150</td>
<td>July 12, 1981</td>
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<td>4: 151</td>
<td>July 19, 1981</td>
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<td>5: 150</td>
<td>July 29, 1981</td>
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<td>6: 150</td>
<td>August 4, 1981</td>
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<td>7: 150</td>
<td>August 11, 1981</td>
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<td>October 20, 1981</td>
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<td>November 7, 1981</td>
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<td>21: 150</td>
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*Audio-taping was discontinued because of problems with the equipment and because the fidelity did not seem to be significantly better than the videotape.
## APPENDIX M.

SAMPLE DATA/TRANSCRIPTION SHEET

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APPENDIX N.

RELIABILITY PROCEDURES

Inter-Judge Reliability Measures

1. The independent transcriber was trained to a criterion of 95% on a practice tape.

2. Since several months had passed between transcription of the first four tapes and the last three, one retraining session was held before transcription of the final tapes.

3. Judgement of Tone-Units: Occasionally (less than 1% of the time) the judges disagreed on the placement of tone-unit boundaries. In these cases, the first instance was scored, so that the second part of the tone unit was skipped (this was done so as not to count all subsequent utterances as errors, when the judgement in error was where the pause between utterances had occurred).

4. Percent Correct was based on a point-by-point analysis of the prosodic and pragmatic utterances only. Four each utterance, four pitch variables (Pitch A, Pitch B, Loudness, and Tempo) and on pragmatic category variable was scored.

Intra-Judge Reliability Measures

1. All tapes were scored 5 months after the last taping session took place, and at least 3 weeks after that tape had been previously scored.

2. Four, five minute segments were scored in the manner described above and a percentage of agreement computed.
APPENDIX O.

DETAILS OF HOME TAPE Sessions

1. Dates of Sessions

<table>
<thead>
<tr>
<th>Date</th>
<th>Number of Utterances</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 15, 1981</td>
<td>6</td>
</tr>
<tr>
<td>August 9, 1981</td>
<td>36</td>
</tr>
<tr>
<td>September 8, 1981</td>
<td>5</td>
</tr>
<tr>
<td>October 10, 1981</td>
<td>35</td>
</tr>
<tr>
<td>November 14, 1981</td>
<td>30</td>
</tr>
<tr>
<td>December 5, 1981</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td><strong>154 utterances, total</strong></td>
</tr>
</tbody>
</table>

2. Rank-Order of Pragmatic Categories' Use on Home Tapes:

<table>
<thead>
<tr>
<th>Category</th>
<th>Number of Occurrences</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Labeling</td>
<td>48</td>
<td>31.1</td>
</tr>
<tr>
<td>2. Req. Act.</td>
<td>18</td>
<td>11.7</td>
</tr>
<tr>
<td>3. Enjoying</td>
<td>18</td>
<td>11.7</td>
</tr>
<tr>
<td>4. Other</td>
<td>15</td>
<td>9.7</td>
</tr>
<tr>
<td>5. Repeating</td>
<td>15</td>
<td>9.7</td>
</tr>
<tr>
<td>6. Answering</td>
<td>13</td>
<td>8.4</td>
</tr>
<tr>
<td>7. Practicing</td>
<td>10</td>
<td>6.4</td>
</tr>
<tr>
<td>8. Protesting</td>
<td>8</td>
<td>5.2</td>
</tr>
<tr>
<td>9. Req. Answ.</td>
<td>8</td>
<td>5.2</td>
</tr>
<tr>
<td>10. Greeting</td>
<td>1</td>
<td>0.6</td>
</tr>
<tr>
<td>11. Calling</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

3. Use of "Dominant" Prosodic Pattern on Home Tape:

<table>
<thead>
<tr>
<th>Number of Utterances</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>112</td>
<td>72.4</td>
</tr>
</tbody>
</table>

Note: For comparison with results obtained in the clinic, please see the Results section of the text.