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**COMMUNICATIVE COMPETENCY IN MIDDLE CHILDHOOD: AN
ANALYSIS OF THE SOCIAL DISCOURSE OF POPULAR AND REJECTED
THIRD AND SIXTH GRADE CHILDREN**

Iowa State University

Ph.D. 1981

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Communicative competency in middle-childhood:

**An analysis of the social discourse of popular
and rejected third and sixth grade children**

by

Ann Marie Berghout Austin

A Dissertation Submitted to the

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Abstract

Two hundred-forty white, rural, third and sixth grade children were sociometrically defined as either popular, amiable, isolated, or rejected. Forty-eight target children were selected from this group for further study. This involved 12 popular children (6 boys and 6 girls) and 12 rejected children (6 boys and 6 girls) from both grades. The subjects were paired with same-sex children in two ways. The children were matched for achievement with a child whom they had chosen as a friend and who had also chosen the target child as a friend on a sociometric questionnaire. They were matched for achievement with a sociometrically defined "amiable" child (referred to as the nonfriend) whom the target child had neither selected nor rejected on his/her sociometric form.

The children were video-taped during a free-play task. Their conversations were transcribed and analyzed through a $2 \times 2 \times 2 \times 2 \times 6$ split, split plot with sub-unit treatments in a Latin Square. Utterance density was significantly different between sociometric status with those children defined as popular speaking more often than those defined as rejected. Physical proximity was significant for sex by grade with third grade girls interacting closer to each other than any other group. Friends touched the target child significantly more often than nonfriends. The utterances of the target child

contingent on the utterances of the match were examined and several significant utterance sequences were noted.

Communicative Competency in Middle-Childhood:
An Analysis of the Social Discourse
of Popular and Rejected Third and Sixth Grade Children

Purpose

The purpose of this study was to investigate and describe the social communications or discourse of third and sixth grade children. Specifically studied were those children identified as popular or rejected according to the sociometric techniques of Peery (1979).

Rationale

Communicative competency is crucial to the organism at any time and especially during middle-childhood when peer interactions become so important. Not only does communicability have survival import, but it also implicates social integration and adjustment.

The volume of literature is particularly light concerning peer communications in middle-childhood. Referential communication and communicative role-taking have received some attention (Borke, 1971; Flavell, 1968; Krauss & Glucksberg, 1969; Rubin, 1972), but freestyle dialogue between children in the middle years has as yet been relatively neglected.

Literature Review

Piaget (1926) was probably one of the first to consider peer communications systematically and developmentally. Initially, he notes, communications in middle-childhood are egocentric. The child can converse, and the listener is acknowledged insofar as there is superficial association with the speaker's action and thought; however, there is no corroboration. The listener's perspective is not fully understood and communications reflect this.

Flavell (1968) further explicates the younger speaker's inability to adapt to the listener. He writes that although the middle-childhood youngster is moving away from an wholly egocentric illusion where all communications reflect the child's own perceptions, between the ages of 6 and 7 the leitmotif of egocentrism still pervades. There is some movement toward role-taking and an appreciation of differing viewpoints, but the adjustment is minimal. According to Flavell (1968), as middle-childhood progresses, the child becomes more aware of another's perspective and sensitive to the necessity for taking it. Between ages 7 and 9 the child realizes relationships vary idiosyncratically with the speaker and listener, but is only moderately successful in coordinating these diversities.

Piaget (1926) suggests that at age 7 or 8 the child begins to amalgamate his own beliefs through compilation and systemization of opinions. Thereafter, as the child groups ideas, he also develops the propensity to cooperate (Piaget,

1967). He is able to collaborate fully, to exchange ideas, and to discuss them objectively. The child thus becomes increasingly facile at interpersonal reciprocity and perspective-taking.

Flavell's research (1968) indicates that by 9 or 10 years of age or older, the child usually is able to coordinate successfully speaker-listener perspectives for separate situations. Since role-taking now occurs, utterances are usually more than mere self-codings. The speaker attends continually to the listener to ascertain feedback or listener needs. As a result, the speaker continually monitors verbal output to record messages whenever a self-coded message would fail.

Borke (1971) and Rubin (1972) also have investigated role-taking in middle-childhood. Borke (1971) told a series of short stories to 200 upper-middle-class children ages 3 through 8. The children were asked to indicate how the child in each situation felt by selecting a happy, sad, afraid, or angry face from a collection of pictures. Her results supported Piaget's position that social sensitivity increases with age, but challenged the assumption that young children are egocentric and unable to understand another person's viewpoint. Rubin (1972), testing kindergarten, second, fourth, and sixth grade children, found that communicative egocentrism was significantly related to popularity in kindergarten and second grade but not in grades four or six. When the common effect of IQ was removed, partial correlations between

popularity and communicative egocentrism remained significant for kindergarten and second grade.

Other studies of peer communications in middle-childhood concern the development of referential communication. Krauss and Glucksberg (1969) analyzed message construction between male pairs in kindergarten, first, third, and fifth grades. The children were separated by an opaque screen and were told to develop identical stacks of blocks under the direction of one of the children in the dyad. Initially, the performance differed little across ages, but third and fifth graders were able to improve much faster than first graders. Kindergarten children showed no improvement at all. IQ did not correlate with the task, although this relationship is limited since no child's IQ fell below 100. The children also suggested a name for each of their abstract block designs. These were collected and listed. Later Princeton undergraduates were asked to match the design to the name the child had given it. Communicative proficiency was found to increase gradually with age; that is, the older the child the more successful the adult was in matching the child's name to the design.

Glucksberg, Krauss, and Higgins (1975) concluded that referential communication skills improve with age because the child becomes more sensitive to the nexus of the problem. Younger children give extraneous information, older children do not. Older children also learn to gauge

nonverbal feedback from the listener. If a listener signals understanding, the message usually becomes shorter and more code-like.

Krauss and Rotter (1968) investigated the notion that certain intra-status codings take place which make communications more intelligible horizontally within stratum rather than vertically between strata. Twenty subjects were divided into the following four groups, low status 7-year-old blacks, low status 12-year-old blacks, middle-status 7-year-old whites and middle-status 12-year-old whites. The children were shown six novel figures and asked to suggest appropriate names for them. The names were then collected and presented to 60 new subjects who represented each of the above four groups. The children were asked to identify the figures to which the names were referring. Middle-status subjects were superior to lower status subjects both as speakers and listeners. Lower status subjects understood and were better understood by, middle-status individuals with 12-year-olds scoring better than the 7-year olds.

In one of the few studies of children's freestyle discourse in middle-childhood, Welkowitz, Cariffee, and Feldstein (1976) examined conversational rhythm between interacting children. Twenty same-sex dyads of previously unacquainted children were formed. Ages ranged from 5.4 years to 7.2 years old. Each pair was involved in two 20 minute conversations spaced 2 weeks apart. A definite rhythmicity of vocalizations was noted as the children jointly synchronized pauses during their conversations.

Useful as these studies are in understanding the communications of middle-childhood, they sparsely represent the information which could be gleaned concerning children's freestyle conversations. Further, because there are so few studies, the area lacks the theoretical unification which could add structure to investigations and, therefore, contribute to model building.

Discourse between preschool children has been investigated more consistently but even during this developmental stage it is still an emerging concern. Through studies involving preschool subjects, Piagetian notions of conversational egocentrism (1926) have been seriously challenged. Researchers now repeatedly demonstrate that preschool children do attend to one another's conversations through behavioral and linguistic accommodations (Garvey, 1974, 1975; Garvey & Ben Debba, 1974; Garvey & Hogan, 1973; Keenan, 1974; Mueller, 1972; Shatz & Gelman, 1973).

Mueller (1972) studied 24 pairs of same-sex, upper-middle class children, ages 3 1/2 to 5 1/2. The children were video-taped during free-play. Communications were rated on clarity, fragments, social adaptations, attention getting devices, content, form, context, speaker attention, listener attention, and distance from each other. Each category had two dimensions, one which would invite success, the other failure. The clarity category, for example, involved the success dimension describing words which were clear

while the failure dimension described utterances in which all or some of the words were unclear. The authors did not necessarily see an improvement with age in communication skills; however, the children seemed very facile in communication. Eighty-five percent of the utterances received replies or at least attracted speaker attention. Ninety-four percent of the utterances involved the speaker looking at the listener, speaker using attention getting devices, or the speaker talking about things of interest to the listener.

Garvey and Hogan (1973) studied 18 dyads, ages 3 1/2 to 5 in a 15 minute play session. The children were matched for age but not sex. Utterances were coded for number of utterances over the sampling period, rate of utterance, degree of mutual engagement or focused interaction, and amount of social speech defined as speech sensitive to the speech or behavior of the partner. The authors found that utterance production was high (one utterance/4.6 sec.). Both children participated equally in verbal activity, and dyad conversation and activity were considered "in focus" 66% of each session. As Mueller (1972) found, children were able to sustain mutually adapted speech beyond simple exchange and through component conversations. Children also knew how to get each other's attention through summons-answer routines.

Later, Garvey and Ben Debba (1974) tested another group of dyads ages 3 1/2 to 5 1/2. Again previous findings were corroborated as mutuality

of interaction was found. Within-speaker variance for number of utterances significantly and positively related to the number of utterances produced by the partner. On the other hand, words per utterance were positively related to age, but again did not vary with the partner's words per utterance.

In three separate studies, Shatz and Gelman (1973) likewise noted the young child's ability to make communicative adaptations to the speaker during discourse. After pretesting 16 4-year-olds on standard tests of egocentrism, the children were then asked to tell an adult and a 2 year-old child about a toy. Although the children performed poorly on the egocentrism task, they were nonetheless able to adjust their speech to suit the listener. All subjects, regardless of whether or not they had younger siblings at home spoke in short, simple sentences to 2 year-olds and used more attention-getting devices with them. When freestyle discourse between the subjects, a 2 year-old, and an adult were analyzed, the 4 year-olds again made the same conversational truncations toward the younger children. Analyses of conversations of the 4 year-olds with their age-mates found that utterance lengths with peers more nearly approximated the utterances lengths the children used when speaking to adults.

Building on our emerging knowledge of children's conversational competencies, Garvey (1974) postulated certain abilities which young children formulate and utilize to regulate their interactions. Thirty-six children, ages

3 1/2 to 5 1/2 years-old were videotaped in dyads during freeplay. Garvey noted that 66% of each session was spent in focused or mutually responsive interactions. Interactions were characterized by reciprocal rounds of turn taking. She suggested that three abilities underlie social play: the ability to distinguish play and nonplay states, the ability to understand and practice basic rules of play such as reciprocity, and the ability to identify and contribute to themes during play. Using the same children, Garvey (1975) also considered the abilities of young children to understand and respond to simple direct and indirect requests. Younger and older dyads produced about the same number of direct requests and both groups were equally successful in following through with the intention of the request. Older children produced twice as many indirect requests as younger children, but for all ages indirect requests were much less frequent than direct requests.

Similar to Garvey, Keenan (1974) noted that twin boys, 2.9 years old, were sensitive to social rules of turn taking and reciprocity in discourse. Further, the children were cognizant of each other in utterance content too. Only 17 or 6.6% of the children's utterances were egocentric. Of these 17 utterances, 7 seemed to be addressed to an imaginary person, 7 involved songs and sound play, and 3 were addressed to a toy animal.

Thus, the preschool literature substantially has established that children's discourse is not usually egocentric, but focused toward and

sensitive to, the listener. Young children seem aware of certain social rules of communication which render their utterances thematically concatenated with the utterances of their conversational partner. Preschoolers also are aware of the rules of reciprocity or turn taking in conversation, and sensitive to the need to maintain and develop conversational themes in discourse.

Since this study compared the freestyle discourse of popular and rejected children, the literature concerning interactive difference between sociometrically targeted children next will be examined. Naturally concomitant with a consideration of social communication come questions of communicative differences between popular and unpopular children. These concerns are important ones, for as Putallaz and Gottman (1981) point out, children with difficult peer relationships often face other problems as well throughout their development. For example, Cowen, Pederson, Babigian, Izzo, and Trost (1973) found a correlation between peer relationship problems as a child and emotional problems in adulthood.

Several recent studies have examined the social behavioral aspects of the interactions of popular and unpopular children. Moore and Updegraff (1964) investigated the relationship between nurturance-giving, dependency, and sociometric status for preschool children. Subjects included 31 boys and 31 girls with ages ranging from 3.2 years to 5.6 years. Using a picture board method of presentation, sociometric status was assessed. The children

were then observed in their preschool and their behaviors catalogued for dependence and nurturance-giving. Nurturance-giving was defined as offering affection, attention, reassurance, and protection. Dependence included such behaviors as seeking physical contact, reassurance, attention, and help. Both nurturance-giving and dependence on other children were positively related to sociometric status. Dependence on adults was negatively correlated with status only for the youngest children.

As Moore and Updegraff (1964) did, Hartup, Glazer, and Charlesworth (1967) also correlated behavioral measures with the sociometric status of pre-school children. Using 32 children, 4.1 to 4.9 years-old, observations were made over 12, 3-minute periods. Behaviors were coded for the number of positive and negative reinforcers the children directed toward their peers. Positive social reinforcers included: attention and approval, affection and personal acceptance, submission, and tokens. Negative reinforcers included: noncompliance, interference, derogation, and attack. Consonant with Moore and Updegraff, who found nurturance positively related to social status, Hartup, Glazer, and Charlesworth noted that giving positive reinforcement was directly and positively correlated with social acceptance. On the other hand, giving negative reinforcement was correlated significantly with low social status. Although children received more positive reinforcement from

peers they liked than from those they did not like, more positive than negative reinforcement was received from both liked than disliked peers.

Gottman (1977) also related certain social behaviors of preschool children to their sociometric status. His subjects included 113 Head Start children, 56 boys and 57 girls, ages 3 to 5. Two sets of observers measured the frequency and quality of peer interaction and the frequency of shy behaviors Gottman called "hovering." Gottman found no relationship between the relative frequency of peer interaction and peer acceptance; however, qualitative measures separated the children into five orthogonal sociometric types which included those disruptive to the teacher, the "stars," the "rejectees," those "tuned out," and the "mixers."

Clearly then, behavioral differences can be catalogued between sociometric types of preschool children. Similar studies have been conducted in middle-childhood with results just as promising.

Rubin (1972) studied 80 children, 10 boys and 10 girls in kindergarten, second, fourth, and sixth grades. The children were asked to name first, second, and third friendship choices. They also were given a communicative egocentrism test. Rubin found that in grades K and 2, perspective-taking ability was related significantly to popularity.

Benson and Gottman (Note 1) examined the interchange of reinforcement between children and discovered distinctly separate social systems

operating within social strata. Subjects included 114 children from kindergarten, first, third, and fourth grades. Using the picture board method of presentation, sociometric measurements were taken. Each child was observed in the classroom during 10, 6-second periods. A significant main effect was found for popularity with popular children receiving more positive and neutral contact from peers than unpopular children. Interestingly, there were no differences between popular and unpopular children's frequency of initiating peer contact; however, when the children's interactional networks were examined it became clear that popular children received and gave more neutral and positive bids to other popular children than to unpopular children. Likewise, less popular children initiated more neutral contacts to other less popular children than they did to more popular children.

Putallaz and Gottman (1979) further detailed the interactional dynamics of popular and unpopular children. Twenty dyads of third and fourth grade children, 10 popular pairs and 10 unpopular pairs, were selected for study. The dyads were videotaped for 10 minutes as they played a word game. Researchers found higher levels of disagreement among unpopular dyads and noted that with these pairs disagreement was more likely to be prolonged and heightened. It was noted further that when popular children disagreed, they often would counter their statements with an expression to the partner as to what was a permissible alternative. Unpopular children,

on the other hand, generally disagreed with each other without proffering a statement of feasible alternatives.

To summarize, interactive differences between popular and unpopular children in preschool and middle-childhood are real and distinct. Popular children seem more adept at perspective taking and referential communication. They receive and distribute more nurturance and positive reinforcement than unpopular children, and they do it within a well-defined subsystem. When they disagree with peers they are much more likely than unpopular children to offer acceptable alternatives to the situation.

Several limitations of scope become apparent when reviewing studies of peer discourse and the interactive styles idiosyncratic to sociometrically different children. Limitations in the discourse literature already have been detailed and include the relative paucity of research concerned with middle-childhood subjects. A further problem is the lack of theoretical framework beyond the Piagetian-Flavellian explanations which could unify and buttress studies of discourse and serve invaluablely to generate hypotheses.

Limitations in the social status literature include the problem that many measures, being frequency counts, lend little information concerning the time sequencing of behaviors. We need to consider more often, as Putallaz and Gottman (Note 2) did, the flow of interactions across time, so that a more cogent mapping of behaviors occurs. Further, as Putallaz and

Gottman (1981) observed, many studies have not controlled for the sociometric status of the target child's partner. Surely if sociometric differences are found between target children, they are there between matches, thus lending covert variance which generally is not considered. Finally, most studies have considered social acceptance as the bipolar dimensions of popularity, unpopularity. Within this context even the poles are strictly relative as they are contingent upon frequency counts of peer mentions. On the other hand, Gottman (1977), Gronlund (1959), and Peery (1979) have proven substantively that sociometric categories can be defined orthogonally beyond the dichotomy of popularity, unpopularity. A more careful honing of sociometric status is thus mandatory.

The present investigation attempted to address these methodological problems. As will be detailed in the next section, discourse was examined as it occurred in a behavior-contingent fashion. Further, children were divided into four sociometric categories in a manner definitively prescribed and consistent for all groups in the sample. Popular and rejected children were targeted according to their score on the Peery (1979), a sociometric instrument which categorizes children socially as popular, amiable, isolated, or rejected. According to a preliminary investigation (Austin & Draper, Note 3) most children in grades 2 through 6 are either amiable or isolated on the Peery; therefore, popular and rejected children were chosen for this

study as they seemed to represent more extreme types. Third and sixth grades were chosen because Flavell (1968) found that much of the developmental change in communication occurs about grade 5 or 6. This is substantiated by the work of Piaget (1926) who found that at age 9 or 10 or later the child is able to understand more fully and adjust more adroitly to speaker-listener variation and to collaborate and exchange ideas, even abstract ones.

To facilitate the examination of discourse in middle-childhood, this study addressed three main questions.

1. How do popular and rejected children communicate with same-aged friends?

2. When paired with another child from the same grade who was neither a positive nor negative sociometric mention for the target child, but was sociometrically defined as an amiable or isolated child, how then do popular and rejected children communicate?

3. Are there any differences in communicative style and competency between popular and rejected children?

Method

Subjects

Two hundred-forty third and sixth graders, consisting of all the children who had obtained parental permission in both grades at River Heights Elementary School, River Heights, Utah and Lincoln Elementary School, Hyrum, Utah, were used as the initial sampling group. Hyrum and River Heights are small rural communities (total population about 3000) contiguous to Logan, Utah, and Utah State University. The children attending these schools are predominantly whites with some Chicanos and native Americans.

In a pilot study conducted in November, 1980, these children were administered the Peery sociometric, an instrument designed to separate children into the categories of popularity, amiability, isolation, or rejection. Forty-eight children were selected from this group for further study. This involved 12 popular children (6 boys and 6 girls) and 12 rejected children (6 boys and 6 girls) from both grades. The work of Wellman (1926) and McCandless and Marshall (1957) found stability of friendship choices within the time span encompassing the administration of the sociometric and the period of major data collection.

Instruments

The Peery sociometric was used to separate children into the categories of popularity, amiability, isolation, or rejection. The sociometric consists of six questions: With whom do you like to play? With whom don't you play? By whom do you like to sit? By whom don't you sit? Whom do you play with outside? Whom don't you play with outside?

After the sociometric was tallied, each child received a visibility and an acceptance score which placed him in one of the four previously mentioned categories on the sociometric circumplex. A visibility score was obtained by summing the number of times a child was mentioned both positively and negatively on the sociometric. An acceptance score was obtained by subtracting the negative mentions from the positive ones. Both visibility and acceptance scores for each classroom were divided by the total number of children participating in that classroom. Thus, regarding circumplex placement, a popular child had high visibility and high acceptance, a rejected child had high visibility and low acceptance, an isolated child, low visibility and low acceptance, and an amiable child, low visibility and high acceptance. Peery's original model did not suggest a sociometric category for those children who had a visibility score but an acceptance score of 0. Such a visibility score thus places him/her along the ordinate rather than in one clear sociometric category or another. The present study classified such children as neutral.

Preliminary attempts to validate Peery's model (Peery, 1979) have indicated significant differences in social comprehension between children in each of the four categories ($F(3,21)=8.187, p < .001$).

Procedure

The 48 target children, consisting of the 12 popular and the 12 rejected children from grades 3 and 6, were paired as follows. All pairs involved same-sex children. The children were matched for achievement on the California Test of Basic Skills (CTBS) with one of their positive sociometric choices. For the most part, this was a pairing of mutual choices since care was taken to match children who had mentioned each other on the sociometric instrument. Unfortunately, it was not possible to match any of the sixth grade rejected boys nor one of the sixth grade rejected girls with mutual choices since they were not chosen by anyone else. Instead, they were matched for achievement with one of their friendship choices who in turn had not rejected the child on his own sociometric. In addition, one of these sixth grade boys named no positive choices at all on his sociometric. Through consultation with his teacher he was matched with a child with whom the teacher felt he was quite friendly.

The purpose of pairing mutual friendship choices was to assess any communicative differences which might be present between popular and

rejected children as they interacted with stated friendship preferences. To maximize any communicative differences between popular and rejected children, the subjects were then matched for CTBS achievement scores with an amiable or neutral child who was neither a positive nor negative sociometric mention for the target child. Achievement was used as a matching device to minimize any differences verbal facility might make in conversation. The order of the target child's involvement with the two partners was randomized through a Latin Square.

The dyads were taken to a carpeted workroom in the school media center. The room measures approximately 4 m x 5 m. A large mat 1.3 m x 1 m marked off in 30 cm squares was placed on the floor. The children sat on the floor at the edge of the mat. Both of them wore lapel microphones which recorded onto a cassette tape recorder. A third microphone placed on the floor in front of the children recorded onto a reel-to-reel Sony video recorder. All interactions were videotaped. The children were asked if they would like to test the microphones by giving their names and ages and then hearing their voices replayed. This was intended to help desensitize the children to the videotaping equipment. They were then told, "I want to know about the things children your age enjoy playing with. I also want to know how children your age play together. Here is an interest basket. I would like you to look through it and then tell me which things you enjoyed most in it." There

were two versions of the interest basket so the target child could use a different version in each pairing. The order of exposure to the baskets was alternated through a Latin Square. The baskets contained parallel forms of over 20 small items (see Appendix A for a complete listing of these items).

Each session was 5 minutes long. The children received instructions from the experimenter after which the experimenter left the children alone in the room. Sessions were timed with a stop watch from the second the experimenter left the room and closed the door. At the end of the 5 minute session the experimenter reentered the room and asked the children which items they preferred in the interest basket and why. This was designed to bring closure to the episode and to help the children feel they had contributed in a substantial way to a scientific investigation.

Data Analysis

All utterances of both children during the 5 minutes sessions were transcribed; however, to streamline data analyses, only the data from the first 3 minutes of the session were analyzed. Two judges, naive to the research design, analyzed these data through a simultaneous examination of utterance transcriptions and videotape.

Analyses addressed the utterances of the target child and the utterances of the partner according to four major concerns: 1) utterance density,

complexity, and canalization, 2) individual utterance characteristics, 3) utterances of the target child contingent on the utterances of the match, 4) verbal or behavioral adjustment of target child or match which signaled sensitivity and awareness of the target child and the partner toward each other. Utterances were defined similar to the protocol of Garvey and Hogan (1973) and involved "periods of one child's speech bounded by the other child's speech or by pauses of 1.1 seconds or more."

1. Utterance density, complexity, and canalization.

These measures reflect the geographic characteristics of the dialogue as mapped out through the continuity or spatial density of the utterance, its internal complexity, and its concatenation with other utterances.

Utterance density was determined by dividing the number of seconds in the session by the total number of utterances. Utterance complexity refers to the average words per utterances. "Words" were very broadly defined as any utterance which conveyed obvious communicative meaning to the other child. Utterance canalization referred to the number of times the partners changed the subject or redirected the conversation to a new topic. For example, perhaps the children were discussing a particular item in the interest basket. A redirection occurred when one partner said, "Look at this toy over here."

2. Individual utterance characteristics.

The purpose of this category was to describe individual utterances types. Utterances types included two subsets: verbalizations, or intelligible

speech or communicative sounds, and sound intervals, or periods of times when the children were emitting sounds which were not intelligible speech.

Verbalizations were divided according to seven types.

Declaratives: The child makes a statement. "This silly putty is like some I have at home."

Declarative-Agreement: The child makes a statement which acknowledges or corroborates a previous statement or move made by the other child. "Hey, you're right, the silly putty does bounce a long ways."

Declarative-Negation: The child makes a statement which contradicts or negates a previous statement or move made by the other child. "No, that's not the way you play with it."

Interrogative: The child asks a question. "What's this?"

Exclamation: The child relays strong emotion in his statement. "Wow, watch how high this bounces!" This category also included individual words such as "ooh," and "gol" which were uttered with strong emotion and obvious communicative intent.

Command: The child gives an order to the other child, to an imaginary person, or to one of the toys. "Sit up straight!"

Unintelligible: Some of the child's utterances were simply not understandable so they were coded as such.

Sound intervals were of two types:

Laugh--If the laugh were longer than 3 seconds it was timed and the length recorded, otherwise it was recorded simply as a laugh.

Other noises--These included such things as airplane sounds, fake coughs, fake sneezes, etc. They were not timed because they rarely lasted beyond 3 seconds.

3. Utterance contingencies.

The utterances of the target child contingent on the utterances of the match were figured. To do this, all utterances types were numbered. A running account of the interaction was then made with the utterance of the match considered first, followed by the target child's response to that utterance. For example, if a declarative were coded 1 and an exclamation 5, and if the match uttered a declarative after which the target responded with an exclamation, then the sequence would be coded 1,5. A silence category was also added to cover those instances when one child said something and the other child responded with silence.

4. Verbal or Behavioral Adjustments of the target and the match toward each other.

Verbal or behavioral adjustments measured the sensitivity and awareness of the target child and the partner toward each other. This involved three considerations.

Touching: The number of times the partner and the speaker touched each other during the session.

Proximity: This category considered the nearness of the children to each other. The measurement was taken every 5 seconds. The judges listened to a tape with 5 second intervals incremented on it. At the sound of a tone the judges noted whether or not the children were within or beyond 30 cm of each other. Distance was measured from collar bone to collar bone and was facilitated by grid lines drawn on the mat on which the children were sitting. In addition to the grid lines on the mat, the judges also taped an acetate sheet to the monitor when taking the proximity measure. On the sheet the grid lines were drawn much darker and were extended up to and beyond the children's heads.

Imitation: The number of times one partner imitated the other in nonverbal posture or verbal manner of expression was considered. For example, nonverbal posture might be imitated if one child put his hand on his chin and rested his elbow on the floor with the other child following suit. Manner of expression would be imitated if one child said, "Let's not play that, it looks weird, whereupon the partner rejoined, "Yeah, it's weird, weird, weird." Number of imitations over the entire session time were tallied both for the target child and the match.

Training of the Judges

Using videotape of a pilot session which was not reanalyzed for data collection, the judges and the experimenter discussed the scoring procedure and related it to examples of behavior on the training segment of the videotape. The judges then worked together on a segment of the same tape. They viewed the interactions simultaneously and discussed the most appropriate ways of scoring them. The judges and experimenter consulted often during this period concerning problems of scoring and procedure. When the judges felt confident of their facility with the scoring procedure, another 5 minute segment of videotape which would not be used for the data collection was viewed by the judges independently. The experimenter examined their training work and felt confident that they understood the scoring procedure. The judges then proceeded to work independently on the data. After the judge's training session certain modifications were made in the data analysis which made the procedure more efficient. The decision was made to use only 3 minutes of tape rather than 5 minutes. After careful analysis of several interactions it was felt that this would streamline the process without sacrificing the quality of data. It was also decided to add the categories of declarative agreement and declarative negation in order to define more accurately the interactions. In addition, the proximity measure was refined through the placement of an acetate sheet on

the television monitor on which the grid lines from the mat were elongated and more clearly delineated.

Interjudge Reliability

Correlations were high between judges on all variables. For the variables density, complexity, canalization, proximity, imitation, and touch, correlations ranged from .93 to 1.00. They included: density, .99; complexity, 1.00; canalization, .98; proximity within, .98; proximity without, .98; imitation, match, 1.00; imitation, target, .97; touch, match, .95; and touch, target, .93.

Interjudge correlations on utterance contingencies included: declarative, declarative, .93; interrogative, declarative, .96; command, declarative, .83; silence, declarative, .91; declarative, interrogative, .94; silence, interrogative, .96; silence, exclamatory, .88; silence, command, .89; declarative, silence, .96; interrogative, silence, .98; exclamation, silence, .79; command, silence, .95; laugh, silence, .99; other noise, silence, .94; silence, laugh, .98; laugh, laugh, .99; silence, other noise, .96.

Results

Data analysis involved a $2 \times 2 \times 2 \times 2 \times 6$ split, split plot with sub-unit treatments in a Latin Square. (See Appendix B.) Analysis generated 28 ANOVAs. Within each of these there were 31 tests of significance per ANOVA yielding a total of 868 tests of significance. It would be expected as a result of random variation that 43 of these would be significant. Since 47 were significant at the .05 level or less, the reader should be cautioned not to over-generalize from these findings.

First considered in the data analyses were the variables of utterance density, complexity, and canalization. Utterance density was significantly different between sociometric status, $F(1,40) = 4.428$, $p < .05$ with those children sociometrically defined as popular speaking more often than those defined as rejected. Means for utterance density/number of seconds in the session for popular and rejected children were 2.4774 and 3.0692, respectively.

Utterance density approached significance for sex, $F(1,40) = 4.024$, $p < .10$ with trends indicating that girls (mean = 2.4911) tended to speak more often than boys (mean = 3.0554).

Utterance complexity was significant only for the interaction between sociometric status, sex, and grade. This result was not clearly interpretable as no clear pattern emerged from inspection of individual means. Square root transformations were performed on the utterance complexity means with again no significant main effects of interactions.

Utterance canalization was not significant for any of the main effects or interactions.

Next were considered the variables of proximity, imitation, and touching.

Proximity was significant for grade and sex by grade. For grade, $F(1,40) = 7.09447$, $p < .025$. Third graders (mean = 8.8646) were significantly more often within 30 cm of each other than sixth graders (mean = 5.5625). For sex by grade, $F(1,40) = 7.829$, $p < .01$, third grade girls (mean = 10.14583) were significantly more often within 30 cm of each other than third grade boys (mean = 7.5333), sixth grade girls (mean = 3.37500), or sixth grade boys (mean = 7.7500).

Frequency of touching was significantly different between friends and nonfriends, $F(1,40) = 8.3497$, $p < .01$. The friend touched the target child (mean = 6.2500) more often than the nonfriend touched the target child (mean = 3.8021).

Behavioral imitation of one another was significant only for the four-way interaction between social status, sex, grade, and match, $F(1,40) = 4.2930$, $p < .05$. This interaction was not clearly interpretable again because no clear pattern emerged from the inspection of individual means.

Utterance contingencies comprised the third and final set of analyses. Frequency of occurrence was figured for each utterance contingent on every other utterance. Every utterance combination which occurred in more than

half of the interactions was subject to an analysis of variance. This included 17 utterance combinations (see Appendix C). The frequency of occurrence for the following utterance combinations was significant. In each pair the first utterance type was emitted by the match and the second utterance type by the target child.

A command followed by a declarative (command-declarative) was significant for sociometric status, $F(1,40) = 6.43569$, $p < .025$. Rejected children and their matches participated in more of this type of exchange (mean = 13.6979) than popular children (mean = 26.4062).

Silence-declarative was significant for the interaction of sex and match, $F(1,40) = 5.52$, $p < .025$. Girls and their friends (mean = 120.5417) and boys and their nonfriends (mean = 128.0208) used less of this kind of vocalization sequence than girls and their nonfriends (mean = 162.0625) or boys and their friends (mean = 152.5833).

Declarative-interrogative was significant for the three-way interaction of sociometric status, grade, and match, $F(1,40) = 5.52$, $p < .025$. Rejected third graders and their friends (mean = 8.1250) and popular third graders and their nonfriends (mean = 7.125) used less of this pattern than popular third graders and friends (mean = 23.1250), rejected third graders and nonfriends (mean = 29.333), popular sixth graders and friends (mean = 22.7917), popular sixth graders and nonfriends (mean = 24.6667), rejected sixth graders and

friends (mean = 27.6667), and rejected sixth graders and nonfriends (mean = 23.5417). (See Figure 1.)

Command-silence was significant for sociometric status by sex by match, $F(1,40) = 6.6364$, $p < .05$, sex by grade by match, $F(1,40) = 5.9128$, $p < .025$, and sex by sociometric status by grade by match, $F(1,40) = 4.9495$, $p < .05$. Analyses of the three-way interaction between sociometric status, sex, and match produced the following means: popular girls and friends, 28.7917; popular girls and nonfriends, 30.2500; rejected girls and friends, 60.75; rejected girls and nonfriends, 29.6667; popular boys and friends, 50.0417; popular boys and nonfriends, 22.95833; rejected boys and friends, 41.70833; and rejected boys and nonfriends, 47.45833. (See Figure 2.)

Analyses of the three-way interaction between sex, grade, and match produced the following means: third grade boys with friends, 33.12500; third grade boys with nonfriends, 37.70833; third grade girls with friends, 56.1667; third grade girls with nonfriends, 25.7500; sixth grade boys with friends, 58.6250; sixth grade boys with nonfriends, 32.70833; sixth grade girls with friends, 33.3750; and sixth grade girls with nonfriends, 34.1667. (See Figure 3.)

The four-way interaction between sociometric status, sex, grade, and match was not interpretable, again because of no clearly emerging pattern.

Analyses of the utterance sequence other noise-silence found $F(1,40) = 4.5319$, $p < .05$, for the three-way interaction between sociometric status,

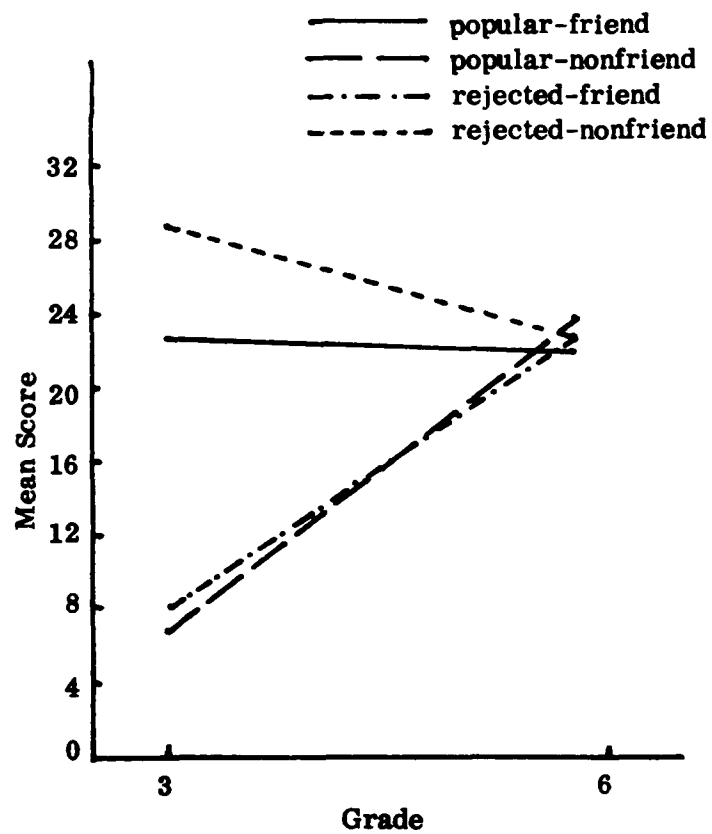


Figure 1. Declarative-interrogative, sociometric status by grade by match.

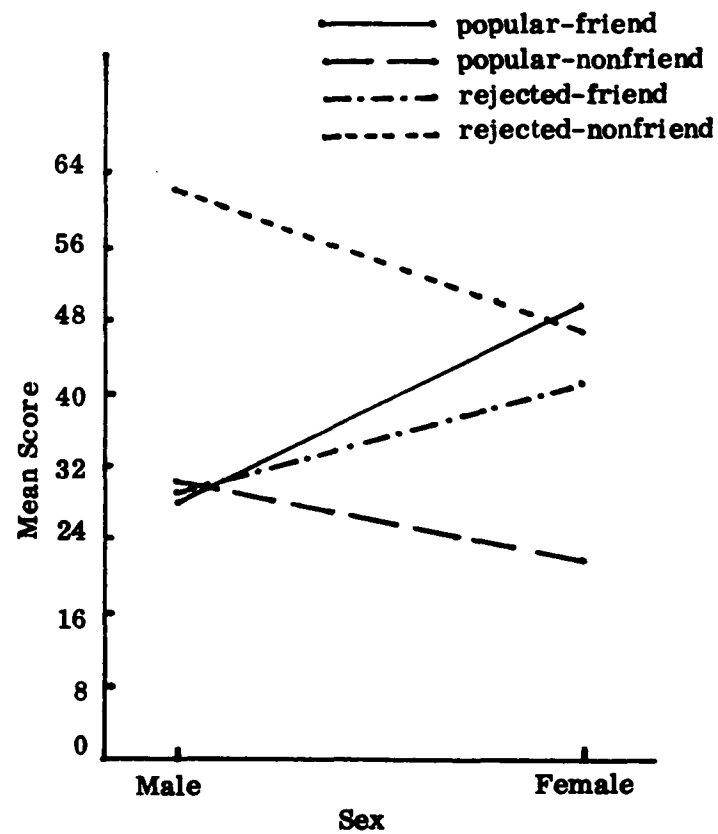


Figure 2. Command-silence, sociometric status by sex by match.

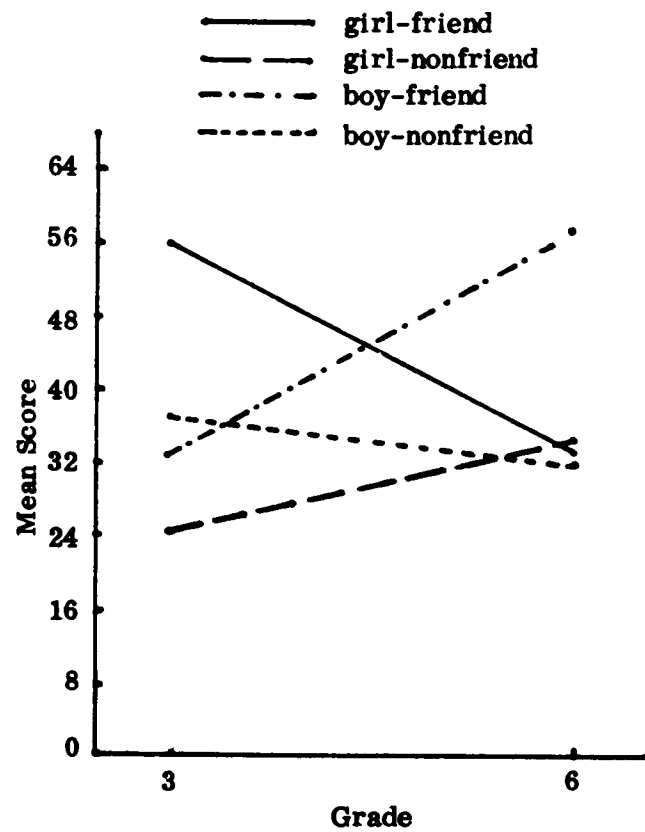


Figure 3. Command-silence, sex by grade x match.

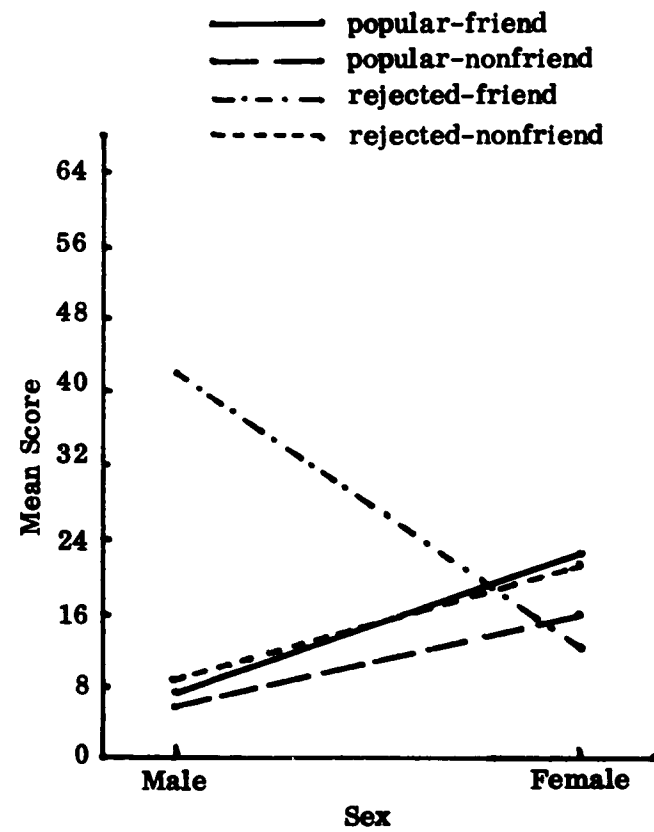


Figure 4. Other noise-silence, sociometric status by sex by match.

sex, and match. Individual means were: popular girls and friends, 7.5417; popular girls and nonfriends, 6.70833; rejected girls and friends, 42.2917; rejected girls and nonfriends, 9.1667; popular boys and friends, 22.3333; popular boys and nonfriends, 16.2500; rejected boys and friends, 12.9167; and rejected boys and nonfriends, 21.0833. (See Figure 4.)

Laugh-laugh was significant for the interaction between sociometric status, sex, and grade, $F(1,40) = 5.933$, $p < .025$. Means were: third grade popular girls, 71.20833; third grade rejected girls, 28.500; third grade popular boys, 24.8333; third grade rejected boys, 55.41667; sixth grade popular girls, 30.000; sixth grade rejected girls, 67.8333; sixth grade popular boys, 57.8750, and sixth grade rejected boys, 53.833. (See Figure 5.)

Silence-other noise was significant for sociometric status and grade, $F(1,40) = 7.1986$, $p < .025$. Popular third graders used this sequence most (mean = 41.8750) followed by rejected sixth graders (mean = 32.500). Means for rejected third graders and popular sixth graders were 18.833 and 17.8750, respectively.

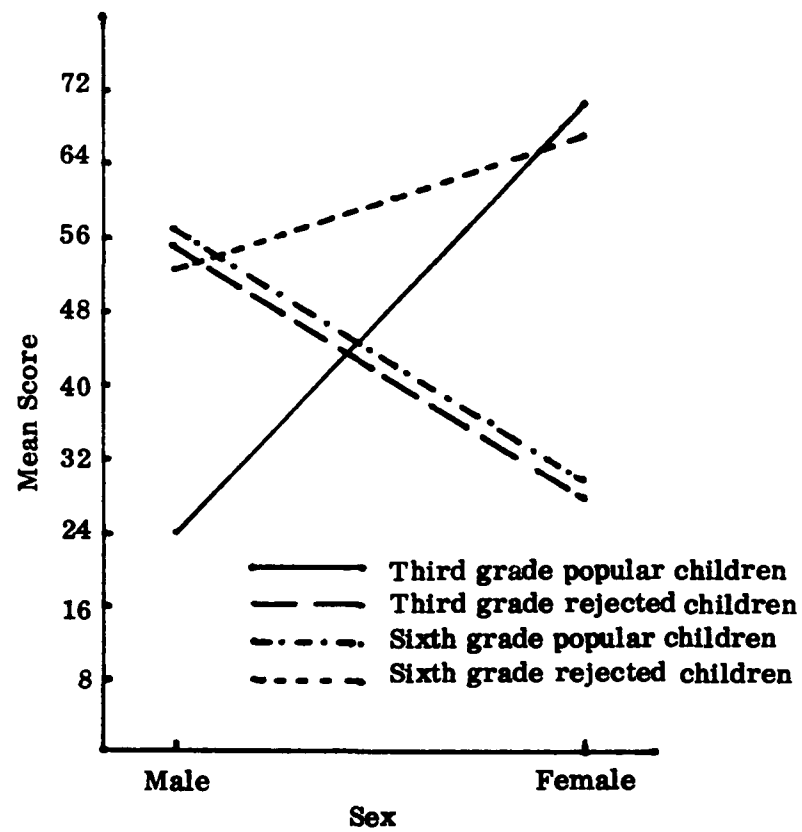


Figure 5. Laugh-laugh, sociometric status by sex by grade.

Discussion

The intent of this study was to examine and describe the social communicative interactions of popular and rejected children as they played with friends and with nonfriends. Several interesting relationships emerged as a result of the analyses.

Initially it is very apparent that popular children and their matches speak much more often during play than do rejected children and their matches. This does not imply that they used more words per utterance, for analyses of complexity indicated no significant differences between groups. Rather it indicates that when total utterances were counted, interactions of popular children involved more total vocalizations than those of rejected children. A t test was performed comparing the popular children's achievement scores on the California Test of Basic Skills (CTBS) with those of the rejected children. $t = 0.858$ with 45 degrees of freedom indicating no significant differences between groups. It is also important to realize that the matches were paired with the target child on the basis of academic achievement; thus, vocalization differences are not readily attributable to differences in measured verbal ability. Putallaz and Gottman (Note 2) and Hartup, Glazer, and Charlesworth (1967) found that the interactions of popular children are more positive than the interactions of unpopular children. It is possible, then, if we may

generalize to the present study that two interacting children emit more vocalizations when the interchange is more positive.

It was found in the proximity measures that third graders sat significantly closer to each other than sixth graders. Particularly is this true for third grade girls. Perhaps this is a relationship directly related to body size. As limbs and trunk elongate, the child then needs more space in which to express himself. This finding points to a possible methodological weakness. For the proximity measure, 30 cm from collar bone to collar bone was used as the standard measurement for both grades. However, instead of using the same distance across ages, future researchers may want to use a ratio of body size to distance and vary distance as body size varies. It is possible too that the relationship is a true one and that younger girls do indeed interact in closer proximity than boys their own age or older boys and girls.

Frequency of touching was significant with the friend more often touching the target child than the nonfriend. It is possible that body contact expressed bid for affiliation or recognition. The friend then was reinforcing or restating their mutual friendship through contact. Interestingly, the frequency of the target child touching the match was not significant. A possible explanation could involve the fact that both popular and rejected target children are those with high visibility in the social system. Perhaps children with high impact do not need to touch others to get attention or maintain the interaction,

while their friends feel the need to touch them in order to further the interaction or reinforce the expression of friendship.

Significant utterance contingencies will next be considered. The command-declarative sequence was significantly used in interactions involving rejected children and their matches; that is, if the match uttered a command, the rejected child was significantly apt to respond with a declarative. These declaratives could be of two types. The first type seemed to be an off-task, rerouting kind of comment, for example:

Match: Hold still!

Target: This is fun.

Match: Pick that up.

Target: This is cool.

Match: You're not supposed to go off this mat.

Target: Oh, this is a beautiful mat.

The second kind of declarative response seemed to be a forthright defiance:

Match: Shut up, they're recording you.

Target: I don't care.

Perhaps commands seem threatening to the rejected child, so he/she responds either through a sidestepping of issues or direct defiance. It is possible too, that a match will utter more commands simply because the interaction involves a rejected child. This is an area for future study.

Commands next emerge as part of the command-silence sequence, an interaction significant for both popular and rejected girls and their nonfriends (see Figure 3). It is possible that girls consider a command an inappropriate interactional form if it comes from a nonfriend and, therefore, counter it with silence.

Silence-declarative was used most often with girls and their nonfriends and boys and their friends. The declarative may be a facilitative move on the part of the target child to continue or reinstate the interaction. Since sex differences were seen it may be a sequence used appropriately with boys and their friends, but not so with girls and their friends. For girls, it may be a measure nonpersonal enough to be used only with nonfriends.

Silence-other noise was used most with popular third graders and rejected sixth graders, thus suggesting a developmental trend. Perhaps a verbal noise sums the best way to break the silence when a child is a third grader, but may be an interactive strategy used only by the popular children. On the other hand, in sixth grade it could be an inappropriate form, used only by the rejected children. Its developmental progression suggests that the

rejected children discover and incorporate the sequence after the popular child has outgrown it as a socially accepted form. Speculations between grades in this and all other measures are limited however, by the cross-sectional nature of the data.

The other noise-silence sequence also emerged as a form used most significantly by rejected girls and their friends (see Figure 4). It is unclear why this form would be a significant sequence but perhaps the nature of an interaction with a rejected child elicits the noise, while the rejected child himself responds with silence, perhaps to convey disapproval. It is possible during the silence that the target child is emitting certain nonverbal behaviors which may transmit approval for the noise, or, on the other hand, may discipline the friend for the utterance. If this is the case, perhaps boys feel no need for the silent regulatory behavior.

Laughter followed by laughter was used most by third grade popular girls and sixth grade rejected girls. Again, this is a sequence which cautiously suggests a developmental trend. Perhaps when a girl is in third grade, the most appropriate response to a friend's laughter is one's own. This may be a response outgrown by the popular sixth grade girls but just being developed by the rejected sixth grade girls.

In summary, it is suggested by these data that there are several differences between popular and rejected children and third and sixth grade

children. It is interesting that more differences arose between sociometric status and grade level than between boys and girls. Benson and Gottman (1975) found distinctly separate social systems operating for popular and unpopular children. It is possible then, that these social systems cut across sex making interactive sequences within the system more alike than sequences between systems, regardless of sex.

Grade differences were also apparent, a finding which is consistent with the theories of Flavell and Piaget. Flavell (1968) found that much of the developmental progress in communication occurs across grades 3 and 4. At the time the child realizes relationships vary idiosyncratically with speaker and listener but he/she is only moderately successful in coordinating these diversities. Flavell further notes that by age 9 or 10 the child is usually able to coordinate successfully speaker-listener perspectives for separate situations. Since role-taking now occurs, utterances are usually more than mere self-codings. The speaker attends continually to the listener to ascertain feedback or listener needs. As a result, the speaker continually monitors verbal output to record messages whenever a self-coded message would fail. Along this same line, it is unclear whether the developmental lag between popular and rejected children is a result of a lag in actual communicative competencies as well. Although there is not much literature to falsify this supposition, its veracity still seems unlikely. For example, Rubin (1972) found no relationship between

communicative egocentrism and popularity in grades 4 and 6. What seems more likely is that popular children develop an efficient communicative pattern in early middle-childhood which is then emulated by rejected children, but at a later age when popular children have replaced it with other sequences. As is the case with most investigatory studies, more questions emerge than are answered, hence necessitating further research.

The discussion will next consider certain methodological and ecological constraints which may have limited generalizations from the data. This will be followed by suggestions for future study.

After the children's conversations were transcribed, various procedural problems became apparent. In the first place, although all transcribers were given the same set of verbal instructions, it became apparent after reviewing their transcriptions that the instructions should have been written as well. Fortunately, the problems spawned by this omission were minor, but they did create irritations for the judges. For example, the typists were told to triple space transcriptions and to star the utterance when it involved a change of speakers; however the directions were not followed in several cases. In addition to a set of written instructions, the typists indicated it would have been helpful to have received a written copy of the procedures and the toys involved in the sessions. A further issue emerged regarding the toys. One item included in each interest basket was a horn.

Needless to say it was the favorite toy for most children; however, one can certainly commiserate with the typists whose nerves were nearly shattered after 3 minutes of horn blasts. Finally, the transcribers encountered various problems of auditory discernment depending on the quality of their tape recorders. In future studies an experimenter would be very well-advised to distribute identical, high quality tape recorders and earphones to all typists.

Transcribers in the present study developed a procedure which proved very efficient and would be worth duplicating in future studies. One typist collected all of the transcriptions from the others, viewed the tapes, corrected any errors, and double-checked vocalizations to make sure all changes in speakers were catalogued. This procedure was not prescribed by the experimenter but became a very valuable aid in standardizing transcriptions.

As mentioned in the Method section, the matching procedure did not take place entirely as planned. None of the rejected sixth grade boys nor one of the rejected sixth grade girls could be matched with a mutual friendly choice since they were not chosen by anyone else. Instead they were matched for achievement with one of their friendship choices who in turn had not rejected the child on his own sociometric. Further, although the intention had been to match target children with a nonfriend sociometrically defined as amiable, in reality the matching procedure had to involve some neutral and isolated children as well. It is interesting that there were no problems

finding target children, that is, popular and rejected children, but that was not the case with the amiable matches. This certainly was not expected due to the large numbers of amiable children found in a previous study (Austin & Draper, Note 3). To eliminate the problem, a future study would surely need to begin with a larger population base.

Other limitations involve the generalities which may be made from the study. It has been mentioned before that developmental trends may be inferred, but only cautiously. The data are cross-sectional and thus severely limited by whatever cohort differences are operating. A further limitation emerges due to the sterility of utterance categories used. It is true that the categories of command and silence are orthogonal and clearly defined; however, they do not offer the richness of interpretation that more qualitative, albeit more subjective, categories could give.

Recommendations for Future Study

1. Research should be done to develop a minimum of utterance categories which trap the variability within them. A factor analysis would facilitate this.

2. It would be interesting to use the present methodology with other sociometric combinations. Combining two amiable children would be useful as one would, perhaps, see different behaviors from two low visibility

children than from high visibility children. The pairing of a popular and a rejected child would be fascinating too, but thorny to discuss in terms of interactional leadership, followership, and covert domination assumed with high visibility youngsters.

3. Parent/child studies would also be intriguing. Attendant concerns could examine the differences between the parent/child interactions of sociometrically different children.

4. It would be interesting to vary children with parents and non-parents to assess interactional differences within and between familial dyads.

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Appendix A:
Contents of Interest Baskets

Basket A:

carved gourd rattle

wooden pick

Pluto push-up puppet

toy digital clock

baseball cards

airplane cards

rescue truck cards

rattle snake rattlers

toy license plates

Barrel of Monkeys game

miniature marble game

rubber pencil and paper to "write" on

toy plastic horn

silly putty

two toy scoops of different sizes

homemade flute fashioned from a small tree limb

magnet, nails, staples

clay

six miniature aluminum cookie cutters

"ball in the basket" skill toy

fossil rock

paper airplane

scratch and sniff cards

Basket B:

Indian arrowhead

Barrel of Monkeys game

fossil rock

old fashioned cookie cutters in a Chinese woven basket

rubber snake

old fashioned butter mold

airplane cards

baseball cards

scratch and sniff cards

Donald Duck push-up puppet

miniature marble game

dice

clay

silly putty

wooden pick

magnet and small items to use with it

plastic horn

toy digital clock

"silly" glasses

carved gourd rattle

miniature toy license plates

space ranger badge

toy medal of honor badge

seashells

plastic cookie

horse badge

deputy sheriff badge

home-made whistle

Appendix B:
Data Analysis

The data were analyzed in the following manner:

$$\begin{aligned}
 Y_{ijklmn} = & \mu + A_i + B_j + C_k + AB_{ij} + AC_{ik} + BC_{jk} + ABC_{ijk} + D_l(ijk) + \\
 & F_m + AF_{im} + BF_{jm} + CF_{km} + ABF_{ijm} + ACF_{ikm} + BCF_{jkm} + ABCF_{ijkm} + \\
 & FD_{lm(ijk)} + J_n + AJ_{il} + BJ_{jl} + CJ_{kl} + ABJ_{ijl} + ACJ_{ikl} + BCJ_{jkn} + ABCJ_{ijk} + \\
 & JD_{ln(ijk)} + JF_{lm} + AJF_{iln} + BJF_{jln} + CJK_{klm} + ABJF_{ijklm} + ACJF_{iklm} + \\
 & BCJF_{jklm} + ABCJF_{ijklm} + E_{lmn(ijk)}
 \end{aligned}$$

Source of Variation	df	Expected Mean Square	
A	1	$\sigma_E^2 + 4$	$\sigma_{JD/2}^2 + \sigma_{FD/2}^2 + 4\sigma_D^2$
B	1	$\sigma_E^2 + 4$	$\sigma_{JD/2}^2 + \sigma_{FD/2}^2 + 4\sigma_D^2$
C	1	$\sigma_E^2 + 4$	$\sigma_{JD/2}^2 + \sigma_{FD/2}^2 + 4\sigma_D^2$
AB	1	$\sigma_E^2 + 4$	$\sigma_{JD/2}^2 + \sigma_{FD/2}^2 + 4\sigma_D^2$
AC	1	$\sigma_E^2 + 4$	$\sigma_{JD/2}^2 + \sigma_{FD/2}^2 + 4\sigma_D^2$
BC	1	$\sigma_E^2 + 4$	$\sigma_{JD/2}^2 + \sigma_{FD/2}^2 + 4\sigma_D^2$
ABC	1	$\sigma_E^2 + 4$	$\sigma_{JD/2}^2 + \sigma_{FD/2}^2 + 4\sigma_D^2$
D/A, B, C	40	$\sigma_E^2 + 4$	$\sigma_{JD/2}^2 + \sigma_{FD/2}^2 + 4\sigma_D^2$

Source of Variation	df	Expected Mean Square
F	1	$\sigma_E^2 + 48 K_F^2$
AF	1	$\sigma_E^2 + 24 K_{AF}^2$
BF	1	$\sigma_E^2 + 24 K_{BF}^2$
CF	1	$\sigma_E^2 + 24 K_{CF}^2$
ABF	1	$\sigma_E^2 + 12 K_{ABF}^2$
ACF	1	$\sigma_E^2 + 12 K_{ACF}^2$
BCF	1	$\sigma_E^2 + 12 K_{BCF}^2$
ABCF	1	$\sigma_E^2 + 6 K_{ABCF}^2$
FD/A, B, C	40	$\sigma_E^2 + 2 \sigma_{FD}^2$
J	1	$\sigma_E^2 + 48 K_J^2$
AJ	1	$\sigma_E^2 + 24 K_{AJ}^2$
BJ	1	$\sigma_E^2 + 24 K_{BJ}^2$
CJ	1	$\sigma_E^2 + 24 K_{CJ}^2$
ABJ	1	$\sigma_E^2 + 12 K_{ABJ}^2$
ACJ	1	$\sigma_E^2 + 12 K_{ACJ}^2$
BCJ	1	$\sigma_E^2 + 12 K_{BCJ}^2$
ABCJ	1	$\sigma_E^2 + 6 K_{ABCJ}^2$
JD/ABC	40	$\sigma_E^2 + 2 \sigma_{JD}^2$

Source of Variation	df	Expected Mean Square
JF	1	$\sigma_E^2 + 24 K_{FJ}^2$
AJF	1	$\sigma_E^2 + 12 K_{AJF}^2$
BJF	1	$\sigma_E^2 + 12 K_{BJF}^2$
CJF	1	$\sigma_E^2 + 12 K_{CJF}^2$
ABJF	1	$\sigma_E^2 + K_{ABJF}^2$
ACJF	1	$\sigma_E^2 + 6 K_{ACJF}^2$
BCJF	1	$\sigma_E^2 + 6 K_{BCJF}^2$
ABCJF	1	$\sigma_E^2 + K_{ABCJF}^2$
JFD/ABC	40	σ_E^2

Appendix C:
Utterance Categories and
Variables Selected for Further Analysis

Utterance Categories:

1. declarative
2. declarative-agree
3. declarative-negative
4. interrogative
5. exclamation
6. command
7. silence
8. unintelligible
9. imitation-verbal
10. laugh
11. other noises

Variables Selected for Further Analysis:

<u>Variable Number</u>	<u>Utterance Combination</u>	
1	1,1	declarative, declarative
2	4,1	interrogative, declarative
3	6,1	command, declarative
4	7,1	silence, declarative
5	1,4	declarative, interrogative
6	7,4	silence, interrogative

<u>Variable Number</u>	<u>Utterance Combinations</u>	
7	7,5	silence, exclamation
8	7,6	silence, command
9	1,7	declarative, silence
10	4,7	interrogative, declarative
11	5,7	exclamation, silence
12	6,7	command, silence
13	10,7	laugh, silence
14	11,7	other noise, silence
15	7,10	silence, laugh
16	10,10	laugh, laugh
17	7,11	silence, other noise