

## TEACHING SOCIAL LANGUAGE TO MODERATELY HANDICAPPED STUDENTS

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Three students with moderate handicaps were taught to initiate and expand on conversational topics. The teaching procedure used stimuli generated from actual conversations with nonhandicapped peers. Generalization was assessed by audiotaping conversations between the handicapped students and their peers in natural school contexts without adult supervision. Results indicated that training generalized to natural contexts. These results were socially validated by undergraduate special education students, who rated tapes of two of the students' conversations during training phases as more socially competent than during baseline. Results are discussed in terms of the evaluation of complex social behavior as multioperant behaviors.

DESCRIPTORS: expressive language, generalization, language, social skills, children

Operant techniques have been used to train a variety of language skills (e.g., Baer & Guess, 1973; Frisch & Schumaker, 1974; Guess, Sailor, & Baer, 1976; Guess, Sailor, Rutherford, & Baer, 1968). One current approach to teaching language, pragmatics (Bates, 1976), minimizes the importance of training syntactic forms and emphasizes the training of communication skills that have functional effects on other people (Sailor et al., 1980). Under this approach, conversational skills such as greetings, expressing gratitude, turn-taking, topic maintenance, question asking, responding to questions, requesting objects or attention, and commenting on features of the setting or an event have been targeted for intervention (e.g., Carr & Kologinsky, 1983; Lancioni, 1982; Leifer & Lewis, 1984; Peck, Tomlinson, Schuler, Theimer, & Haring, 1984; Reichle, Rogers & Barrett, 1984; Warren, Baxter, Anderson, Marshall, & Baer, 1981).

Pragmatic analysis is consistent with Skinner's (1957) theoretical account of verbal behavior in

that it stresses a functional, as opposed to a structural, analysis of language use. In conducting a pragmatic analysis, judgments concerning the effectiveness of a given utterance are made by analyzing the effect that the utterance produced on subsequent responses by others in the situation. In analyzing children's language under natural conditions, the meaning of an utterance is often interpretable only with reference to the context (i.e., the ongoing stimulus events and the effects produced by the child's communicative attempts) within which the utterance is made (Bloom & Lahay, 1978; Lloyd & Beveridge, 1981). The purpose of the investigation reported here was to analyze the multioperant control of natural conversational exchanges between disabled students and their nonhandicapped peers.

Communication within a social context is characterized by the reciprocal exchange of utterances. Unfortunately, although the training of syntactically correct initiations has been demonstrated, there are few examples of studies showing turn-taking or communicative exchanges beyond one or two utterances (Gaylord-Ross, Haring, Breen, & Pitts-Conway, 1984). In our research, we taught such skills to students who had difficulty in initiating and maintaining conversational exchanges. Our purposes were: (a) to increase the variety of appropriate conversational initiations of the students,

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This research was supported by grant #G008104154, Special Education Program, U.S. Department of Education. We thank Craig Kennedy for his graphic work. We fondly dedicate this article to Amy Lafata who inspired us to conduct it.

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(b) to increase the students' maintenance of conversations by expanding on the statements of peers, and (c) to evaluate the social validity of conversation training.

## METHOD

### *Subjects*

Three moderately handicapped students from a special education classroom on a regular elementary school campus participated in the study. Although the students had relatively good receptive and expressive language capabilities (200+ word vocabularies, ability to follow three- or four-step commands and nine- to 10-word sentence formation), these skills were not used regularly in conversations with peers. Informal observations indicated that when nonhandicapped peers initiated social exchanges, the students' replies were either brief or not appropriate to the topic that was introduced. Objectives from the students' Individualized Instructional Plans included increasing appropriate conversation behaviors.

Mark was 13 years old and was estimated to be functioning within the moderate to severe range of mental retardation (Stanford Binet IQ = 40). Although his articulation was generally poor, he was often able to make himself understood by repeating statements. Informal observations of Mark in social contexts indicated that he frequently initiated conversations with peers, but 80% of his topics were either inappropriate to the situation or were age-inappropriate. Mark would respond appropriately to about 80% of the initiations by familiar adults, but to fewer than 50% of the initiations by nonhandicapped peers. Using the Peabody Picture Vocabulary Test (Dunn, 1980), Mark's vocabulary was estimated to be equivalent to a 5-year-old.

Ann was 10 years old and had Down syndrome. She greeted and responded consistently to questions from familiar adults, but rarely responded to peers, except to giggle or make unrelated statements. Using the Denver Developmental Screening Test (Frankenburg & Dodds, 1967), Ann was estimated to be functioning at the 3.5- to 4.5-year level (Stanford Binet IQ = 58). The Peabody Pic-

ture Vocabulary Test indicated that her vocabulary was equivalent to that of a 6.2-year-old.

Kim was 13 years old and classified as moderately retarded (WISC IQ = 57). She never initiated conversations with nonhandicapped peers; however, she occasionally initiated brief interactions with familiar adults. Kim never expressed greetings in social or work situations. She responded appropriately to greetings from others approximately 30% of the time. Using the Peabody Picture Vocabulary Test, Kim's estimated age equivalent was 6.6 years.

Nonhandicapped peers were eight fifth graders who worked and ate with the subjects. One to three nonhandicapped co-workers (depending on the task) worked with each subject as a team. After work, the team ate lunch with other nonhandicapped co-workers so that, typically, one subject and five nonhandicapped students sat together. All of the fifth graders in the school were given an opportunity to work in the lunch room at some time during the year. Because the lunchroom jobs were seen as privileges and as a means to leave class early, nearly all fifth graders elected to participate. For purposes of the study, the nonhandicapped students were randomly selected from two fifth grade classrooms. New co-workers were introduced every 3 weeks. No instructions were given concerning appropriate ways to interact, although approximately 75% of the peers had prior experience interacting with the subjects during organized leisure activities in the special education classroom.

### *Trainer and Observers*

All training was conducted by a certified teacher (the third author). All generalization sessions were tape recorded and four reliability observers coded data from the recordings. The observers were trained to code data using audio tapes of social conversations prior to actual data coding for the study. Training of observers continued until inter-observer agreement scores of 90% or greater across all categories were obtained between the coders and the first author across at least two 15-min tapes.

The observers were not informed as to the experimental nature of the study.

### *Settings*

Generalization and training sessions occurred in the school cafeteria. The cafeteria contained 40 lunch tables, a counter to distribute lunches, and a window where cookies were sold. Subjects received conversation training at the lunch table where they typically ate with their co-workers and at a work station (the cookie window for Ann and Kim and the lunch counter for Mark). No co-workers were present during training.

During training sessions, the teacher and the student simulated the activity that was to be performed during the actual conversation. Mark's cafeteria job was to stack empty metal trays as students going through the line took lunches. Ann's and Kim's task was to distribute cookies that were sold from the window.

### *Selection of Training Stimuli*

Two assessment procedures were used to select age- and situation-appropriate stimuli. First, 80 fifth graders were interviewed to determine topics of conversation that they typically had with their friends. The interviewer asked questions such as, "When you first sit down with your friends at lunch, what do you say?" and "If someone said that to you, what would you say?" The interview procedure yielded over 40 initiation and expansion statements. However, because the interview procedure was time consuming, the procedure was subsequently modified: A group of five fifth graders was given a set of questions similar to those asked by the interviewer, and each was asked to interview five friends and write down their answers. Over 30 statements were identified using this procedure. Both assessment techniques were conducted during the previous school year so that none of the students who participated in the assessment procedures participated in the study.

### *Experimental Design*

For Mark, a multiple-baseline design across response classes (initiations and expansions) was used.

For Ann and Kim, the multiple baseline was used across response classes and across students.

### *Experimental Procedures*

*Baseline.* A subject was given the cue, "What do we talk about?" six times during each session. No further instruction, correction, or feedback was given. If the student initiated a conversation, the teacher acknowledged the initiation (e.g., "Oh, that's good") and briefly answered any questions but did not offer subsequent expansions of the student's topic. To gather baseline data for expansion training, the teacher, at 1-min intervals, attempted to initiate an interaction using a prepared list of 10 age-appropriate conversational initiations. Sessions typically lasted 10 min.

*Initiation training.* Instructional procedures generally conformed to the model described by Halle (1982). That is, training occurred in the conversational environment, the responses taught were typical of that environment, opportunities to initiate conversations were provided, and correct conversational responses were followed by natural consequences (i.e., by conversation from the teacher).

The teacher waited for 30 s to give the subject an opportunity to initiate independently an interaction. If the subject did not initiate an interaction within that time, the teacher cued the subject by asking, "What do we talk about?" The subject was allowed 15 s to respond. A response was considered correct if it introduced a topic that had not already been discussed during that session and was considered by the teacher to be situation- and age-appropriate. Thus, correct responses could be either an initiation that the subject spontaneously produced while working or a response to the cue from the teacher.

If the subject initiated an appropriate topic, the teacher would enthusiastically discuss it and expand upon the initiation. For example, if a subject initiated an interaction with, "What are you doing after school?" the teacher might respond, "I'm going to play with my dog on the beach and go for a run! What are you going to do?" The teacher responded to subsequent conversational responses

in a cheerful and direct manner, but did not offer further expansion questions.

If the subject did not spontaneously initiate an interaction within 30 s and did not respond within 15 s to the teacher's cue, or introduced an inappropriate topic, the teacher modeled an initiation response. For example, the teacher would say, "Say, 'what are you doing after school?'" If the subject initiated a previously used statement from that session, the teacher said, "You need to think of something new to say" and gave the subject an additional 15 s to produce a novel (for that session) initiation. If the subject did not then produce an appropriate initiation, the teacher modeled one. Correctly imitated responses were followed by praise from the teacher (e.g., "That's good"). Although the teacher modeled statements from a relatively small list of initiations (six to eight) for each subject, the teacher varied the wording from session to session (e.g., the initiation, "Did you see Family Feud last night?" might be modified to, "Did you see MASH last night?").

Three trials for Ann and Mark and four trials for Kim were conducted in each environment during each session. Eight training sessions were conducted per week. On days when two sessions were conducted, the data from those two sessions were combined. Training was conducted 30 min before lunch each school day with additional sessions conducted in the afternoon. In addition, during transitions to and from the classroom for each training session, the teacher would discuss the importance of having interactions with peers and remind the subject to initiate conversations.

*Expansion training.* During simulation of work or lunch activities, the teacher produced statements at 1-min intervals to serve as cues for the subjects. After the teacher initiated an interaction, the subject was given 15 s to respond. When the subject produced a response, the teacher judged whether or not the statement was an expansion statement. As during initiation training, if the subject produced a correct expansion, the teacher discussed it with great enthusiasm. If the subject did not respond within 15 s or produced a statement that was an incorrect expansion, the teacher would

prompt and praise a correct expansion. For example, the teacher initiated an interaction with, "There are people in line" and if necessary, prompted an expansion by saying, "Do you think it will be busy?" If the subject produced an expansion that was the same as one previously produced in the session, the teacher said, "Think of something new to say" and waited 15 s. If the subject produced a correct expansion, the teacher enthusiastically discussed the topic. If the subject did not produce a correct answer, the teacher prompted (modeled) a correct expansion. Initiation statements were never repeated within a session. If a subject spontaneously initiated conversations during expansion training, those topics would also be discussed in a cheerful manner. Sessions contained five trials. Two sessions were conducted per day, and the data from the two sessions were combined for analysis.

*Generalization.* Generalization was assessed prior to the collection of training data. Before each generalization session, the teacher placed a tiny (2 cm × 6 cm × 10 cm) microcassette audio recorder in the pocket of a T-shirt that each subject wore under a shirt. Although the recorder was inconspicuous, the co-workers (and their parents) were informed that we would be recording conversations to study the language development of the handicapped subjects. Prior to actual generalization sessions, the subjects wore the recorders for several days so that all were accustomed to the procedure.

Sessions began when one of the subject's peers came to the special education classroom and accompanied the subject to the cafeteria. No instruction, correction, or feedback was delivered to any participant. Trainers and observers were either absent from the setting or observed the sessions unobtrusively from at least 20 feet away to take general notes on the events that occurred.

*Maintenance.* When training was terminated for a given response class, generalization probes continued to be conducted. Thus, maintenance sessions were identical to generalization probes except that training was no longer conducted for that response class.

### Measurement and Coding of Generalization Data

Twenty minutes from each tape (the entire 10-min work period and the first 10 min of each lunch period) were transcribed. Transcribers wrote exact statements made by the students as well as notes concerning the general context of the conversations (e.g., laughter, teasing). The transcriptions included accurate timings that indicated when the utterance occurred. Thus, conversational units could be identified and separated from each other on the basis of measured gaps between utterances and shifts in conversational topics. The transcribers coded each utterance to identify who produced each statement and to whom it was directed (if possible).

*Coded response classes.* The categorical system developed for this study was based on an interactional analysis format (e.g., Cairns, 1979). The unit of analysis for the study was conversational exchange within a dyad. Thus, conversations that were directed to larger groups of students were not analyzed. The following definitions were applied when scoring each conversational unit.

1. Initiations were any statements that began a conversation, changed a topic, or provided an instruction to initiate some action. An initiation could be scored as such even if it did not lead to a verbal acknowledgment. For the purposes of scoring the generalization data, initiations by the handicapped subjects needed to be situationally appropriate. If not, they were classified as "inappropriate verbalizations." Finally, if a statement contained two potential initiation statements (e.g., "Hello. Can I play?"), only one initiation was scored. Thus, each person's "turn" in a conversational chain was the basic unit of analysis.

2. Expansions were defined as statements or questions that served to continue, in fact or potentially, a conversation. To be scored as an expansion, a statement needed either to elicit a direct response (i.e., a mand or a question) or to add new information into the conversation. For example, in one conversation, a peer initiated the interaction by saying, "Mark, no, no, no, you can't pull it up that far" (referring to the height of his

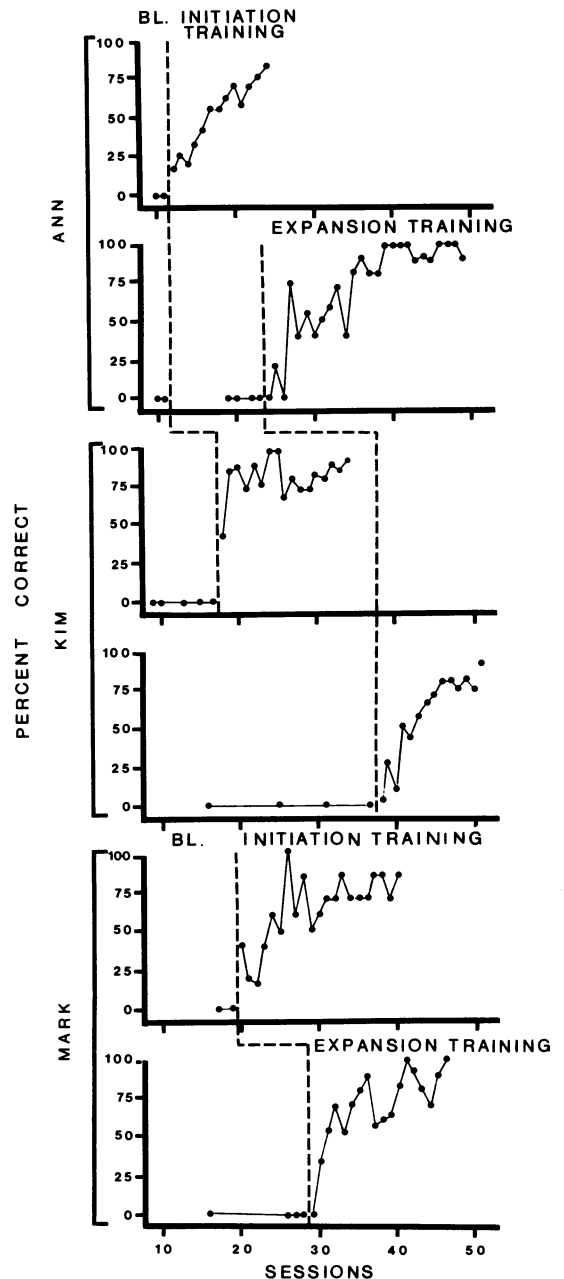


Figure 1. Percentage of correct initiations and expansions for Mark, Ann, and Kim during simulation baseline and training sessions.

stack of trays). Mark answered, "All right, there," which was scored as a response (not an expansion). The peer then said, "Don't touch it" (the rack), which was scored as an expansion. Mark then said, "Why you pushing it down?," which was scored

as an expansion because it was a question. Repetitions of previous statements in the conversation were not coded as expansions. As with initiation responses, if a student produced a situationally inappropriate statement within the chain, it was coded as an inappropriate verbalization even if the peer responded to it.

3. Responses were statements in response to a peer's utterance that provided a minimum amount of information. This category included any statement that merely repeated previous statements, socially polite responses (e.g., "Thank you"), and statements that directly answered a question without elaboration, including "yes" and "no" answers. Responses often served to acknowledge a social response, without elaborating or providing the basis for a further response.

4. Inappropriate verbalizations consisted of repetitive phrases, singing nonsense words, out of context statements, or age-inappropriate statements.

5. Unintelligible statements were coded by the transcribers when an utterance could not be understood from the tape recording; these were not analyzed.

*Initiation-response categories.* Initiation responses were further classified according to their function (comment, request/mand, or greeting), the nature of the topic (e.g., own action, other's action, location, time of day, feelings, hunger, possession, personal appearance, description of an object or an event's characteristics), and temporal reference (past, present, or future). For example, initiation-response categories for Mark included comment about self-action in the future, comment about object in the present, comment about self-feeling in the present, question about food in the future, and question about self-action in the future. The taxonomy allowed a maximum of 73 initiation-response categories.

The frequency of different initiation-response categories was recorded for each session. A lexicon was tabulated for each subject each day that showed the raw frequency of responses, the frequency of categories, and the frequency of novel (never produced before in the study) response categories.

### *Reliability*

Interobserver agreement measures were taken on 52% of the sessions and for all participants across each phase of the study. Observers recoded transcriptions of the generalization data to assess the agreement of the coded data as initiations, expansions, responses, or inappropriate verbalizations. Point-by-point percentages of agreement were calculated (Kazdin, 1982) by dividing the number of agreements by the number of agreements plus the number of disagreements. Interobserver agreement collapsed across response categories ranged from 77%–100% with a mean of 94.8%. For the frequency of initiation responses, the range was 80%–100% with a mean of 94.4%. For expansion responses, the range of interobserver agreement was 58%–100% with a mean of 91.2%. For responses, the range was 85%–100% with a mean of 96%. The reliability of coding the initiation responses into the initiation categories was estimated by having two coders independently code 33% of the initiations into categories. Interobserver reliability was 86%. Finally, the reliability of the transcriptions was checked across five sessions by having two observers independently produce transcriptions. One observer (the first author) then scored both transcriptions. The percentage of agreement across transcriptions was 92%.

### *Social Validity*

Two types of social validity data were collected. First, the interactions between one randomly selected fifth grader and his nonhandicapped peers were recorded during task and lunch times. The frequency of different response classes per session was assessed in the same manner as previously described for the subjects.

Second, one baseline and one intervention (expansion training) tape were randomly selected for both Mark and Kim, and were played to a group of 44 undergraduate students enrolled in an introductory special education course. The sample of tapes was limited to 20-min listening time. The undergraduates listened to and rated the first 5 min of the recordings taken during lunch. The

tapes were played in counterbalanced order so that for one subject the baseline tape was played first, and for another the treatment tape was played first. The students then filled out a questionnaire that asked: (a) Is there a noticeable difference in the quality of interaction between tapes 1 and 2? (b) In which sample did the person express the greater range of topics? and (c) In which tape does the person seem most competent in social situations?

## RESULTS

### *Training*

Figure 1 presents the training data that were collected in the simulated work and lunch settings. Mark exhibited no correct initiations or expansions during baseline. When initiation training was introduced, his correct initiations increased rapidly; by the end of training, Mark was consistently producing appropriate initiations in 70% of the trials. Similarly, when expansion training was introduced, Mark's percent correct responses rapidly increased. The training data for Ann and Kim show similar results: no correct responses during baseline, followed by rapid and substantial improvement in both initiations and expansions during training.

### *Generalization Data*

Mark's generalization data (Figure 2) show that his frequency of initiations was variable throughout the study; however, improvement as a function of training can be seen. During baseline, Mark averaged 8.6 initiations per session. His initiations increased to a mean of 13.9 during training and were maintained at a mean rate of 13.8 per session.

The frequency of Mark's expansion responses is shown in the bottom graph in Figure 2. These data show little change from baseline to training, although there appeared to be an upward trend during the last five sessions of the study. The effects of expansion training can be seen more clearly in the middle graph, which shows the percentage of conversations initiated by the peers to which Mark produced an expansion response (dark shading). These data indicate that Mark was using expansion responses on a higher percentage of occa-

sions ( $M = 33.3\%$ ) following expansion training than during baseline ( $M = 22.5\%$ ).

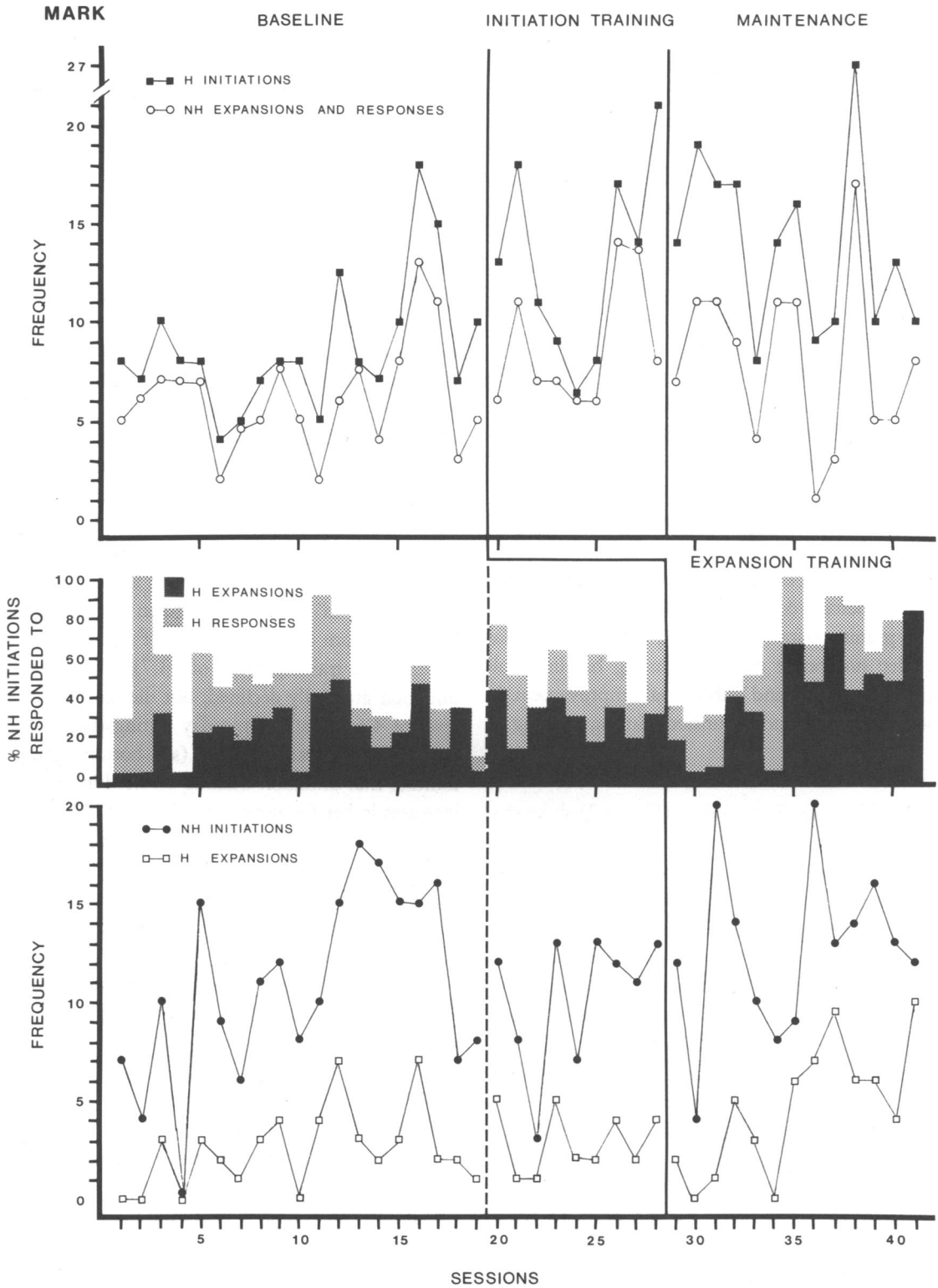
The generalization data for Kim and Ann are represented in Figures 3 and 4, respectively. In contrast to Mark, both girls showed almost a complete absence of social conversation responses during baseline.

Kim's generalization data (Figure 3) show that her frequency of initiation statements gradually increased when training was introduced. Similarly, when expansion training was introduced, an increase in the frequency of expansion statements was observed; the percentage of nonhandicapped initiations that Kim expanded on (see middle graph) also increased. By the end of the study, she expanded on 100% of her peers' initiations across 3 consecutive days; however, this actually represents only a limited number of expansions of nonhandicapped initiations on those days (see lower graph).

Ann's data (Figure 4) show that initiation training resulted in a rapid increase in her initiation behavior (from a baseline mean of 1.5 initiations per day to a training mean of 13.7). This level of initiation gradually declined, but did stabilize at a level of 4.6 initiations per day during the last 11 days. Ann's expansion data (see bottom graph) indicate that initiation training resulted in gradual increases in her frequency of expansions. The middle graph indicates that the percentage of nonhandicapped initiated conversations expanded on by Ann gradually rose from the baseline level of 5.8% to 41.9% during expansion training. As with Kim, Ann was expanding on 100% of the conversations by the end of the study; however, there were few opportunities to produce expansion responses.

### *Diversity of Initiation-response Categories*

Figure 5 shows the number of response categories of which the subjects' initiations were comprised. All three subjects displayed increases in the number of categories used per session as a result of initiation training. These data indicate that the increases in raw frequencies of initiation (see Fig-





ures 2, 3, and 4) were not merely repetitions of earlier statements.

### *Social Validity*

In comparing baseline data with expansion data for Mark (Kim), 38 (37) of the 44 undergraduate students indicated that the interactions were of higher quality during the intervention phase. Similarly, 42 (34) of the students reported that Mark (Kim) showed a greater diversity of social statements during treatment, and 44 (40) students believed that he (she) sounded more socially competent during treatment. The social validity of the initiation response category data was assessed by recording the interactions between one nonhandicapped student and his nonhandicapped peers for five consecutive sessions. This peer used a mean of 9.4 categories per session (compared to 8.0 for Mark, 2.9 for Kim, and 8.2 for Ann).

## DISCUSSION

Mark, Ann, and Kim made increasing use of initiation and expansion skills in unsupervised eating and working situations as a result of the training. Mark's baseline data indicated that, to a great extent, initiation skills were already in his repertoire prior to instruction. The training increased his frequency of initiation response categories, such that he was consistently producing a frequency of initiation categories similar to a randomly selected fifth grader by the end of the study. Ann's data also indicated that initiation training served to increase her use of an existing skill. In contrast, Kim gradually increased her frequency of initiation both in training and generalization contexts. Thus, it appears that she may have lacked skills to produce initiations to a greater extent than Mark or Ann. In summary, a major result of the training was a

facilitation of the use of initiation skills, in contrast to the acquisition of a completely new skill (with the possible exception of Kim).

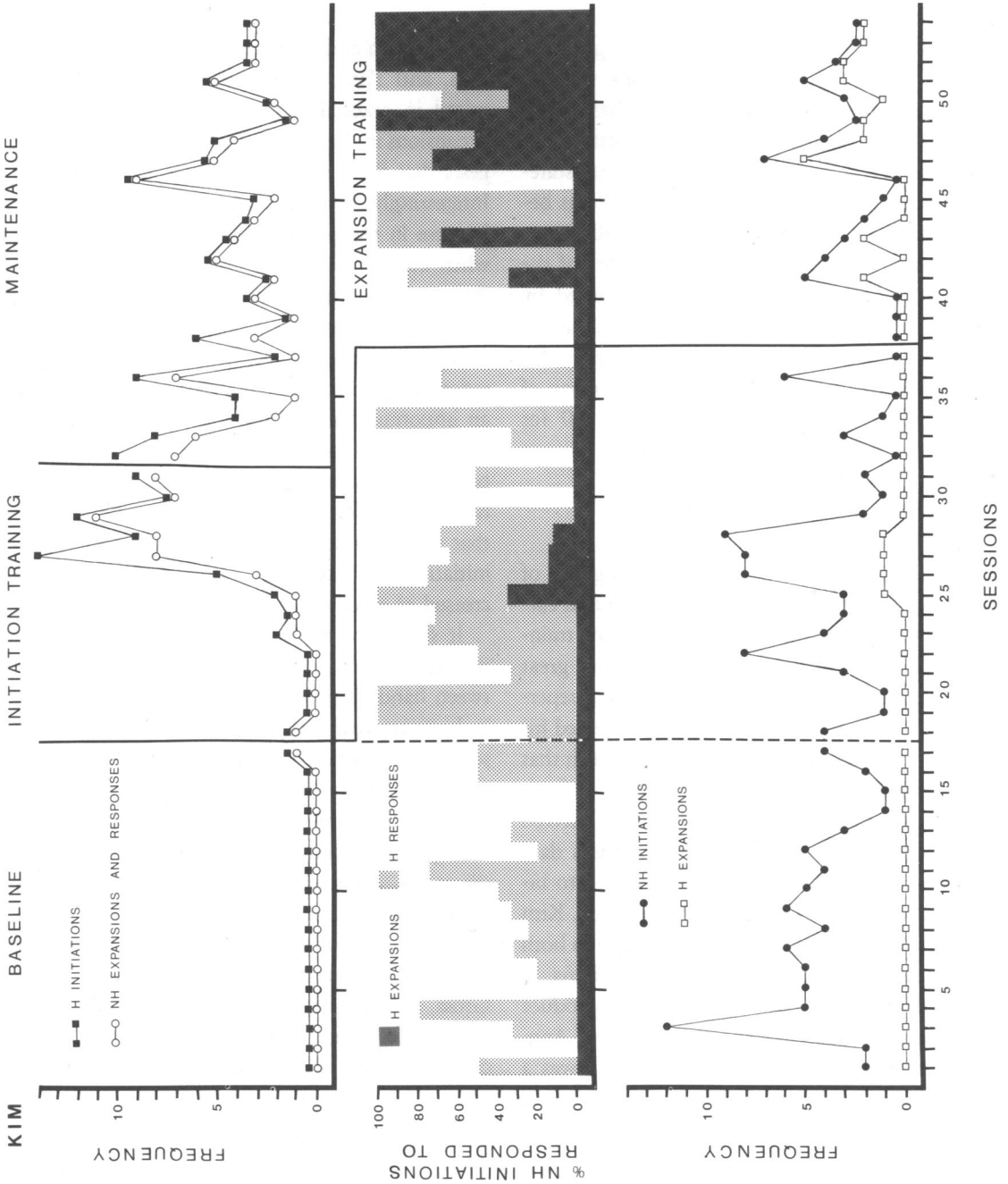
The data for the facilitation of expansion responses indicate that these skills may be more difficult to learn and use in natural settings. For Mark, Ann, and Kim, the introduction of training resulted in gradual increases in the production of expansions in the generalization setting, which suggests that these skills were being newly acquired. Interestingly, both Ann and Kim showed a slight increase in the production of expansion responses when initiation training was introduced. This evidence of an interrelationship between expansion and initiation response skills is theoretically interesting because it may indicate that social conversation skills are controlled by several variables. First, an important variable is the subjects' skill in producing contextually appropriate initiation or expansion responses. In addition, conversational behaviors may form a complex cluster of responses that functions as a broad operant, so that when initiation responses were increased, expansions increased as a collateral effect.

It should be stressed that the school in which this study took place promoted integration between handicapped and nonhandicapped students in both structured and nonstructured settings for several years prior to this study. Given the dramatic effect that responsivity produces on language use skills, the importance of active integration efforts probably played a substantial role in the increases in conversational language use by these subjects in the natural lunchroom setting.

The findings of our study conflict with the findings of numerous social skills studies (cf. Berler, Gross, & Drabman, 1982) in that we found considerable evidence of generalization. In their discussion, Berler et al. point out that social skill

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Figure 2. Mark's generalization data. Top panel: Mark's initiations (H initiations) and the sum of his nonhandicapped peers' expansions and responses to those initiations. Middle panel: percentage of nonhandicapped students' initiations that Mark expanded on (dark shading) and responded to (light shading). Bottom panel: frequency of the nonhandicapped peers' initiations and the frequency of Mark's expansion responses.



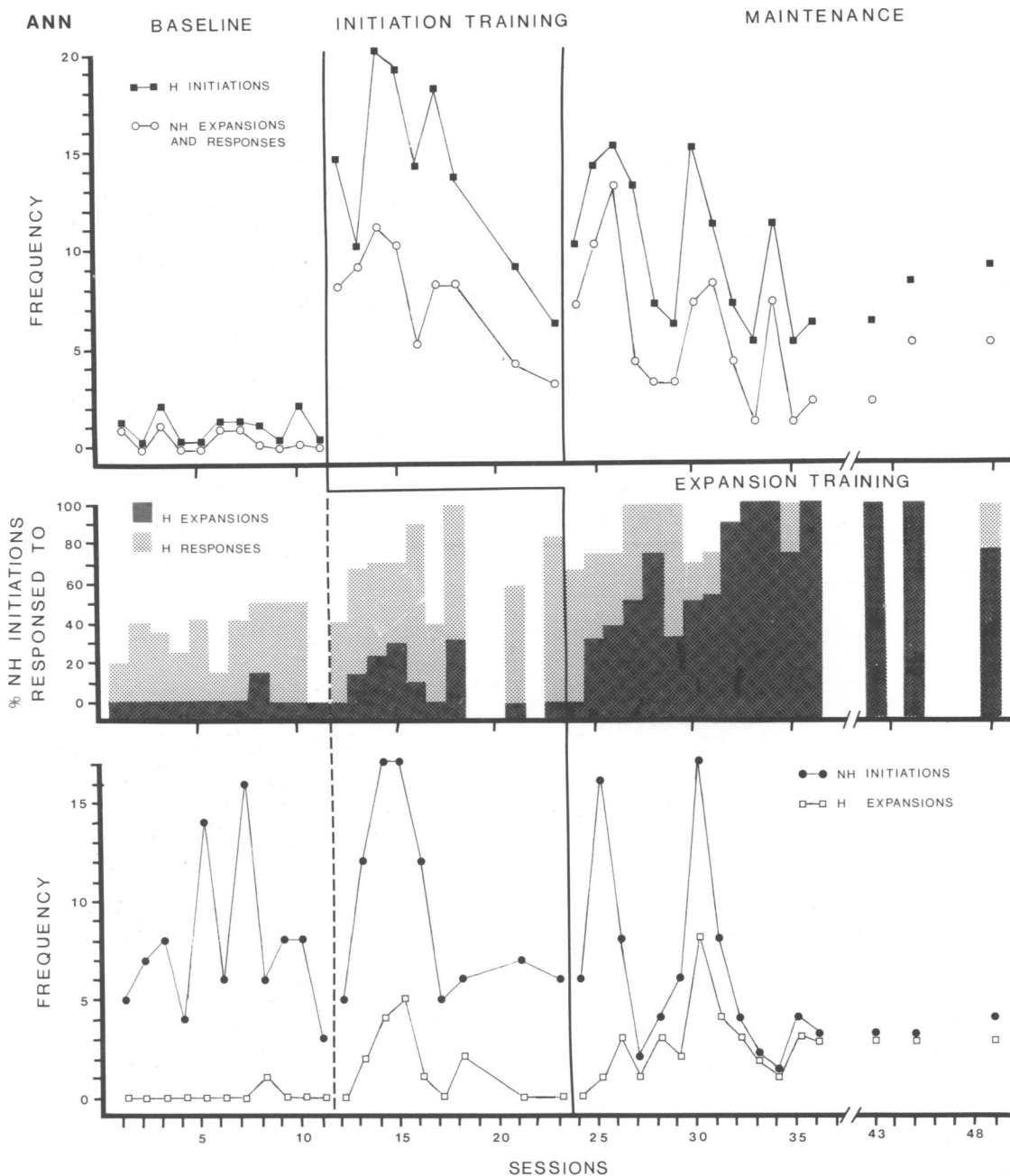


Figure 4. Ann's generalization data. Top panel: Ann's initiations (H initiations) and the sum of her nonhandicapped peers' expansions and responses. Middle panel: percentage of the nonhandicapped students' initiations that were expanded on (dark shading) and responded to (light shading). Bottom panel: frequency of the nonhandicapped peers' initiations and the frequency of Ann's expansion responses.

← Figure 3. Kim's generalization data. Top panel: Kim's initiations (H initiations) and the sum of her nonhandicapped peers' expansions and responses. Middle panel: percentage of the nonhandicapped students' initiations that were expanded on (dark shading) and responded to (light shading). Bottom panel: frequency of the nonhandicapped peers' initiations and the frequency of Kim's expansion responses.

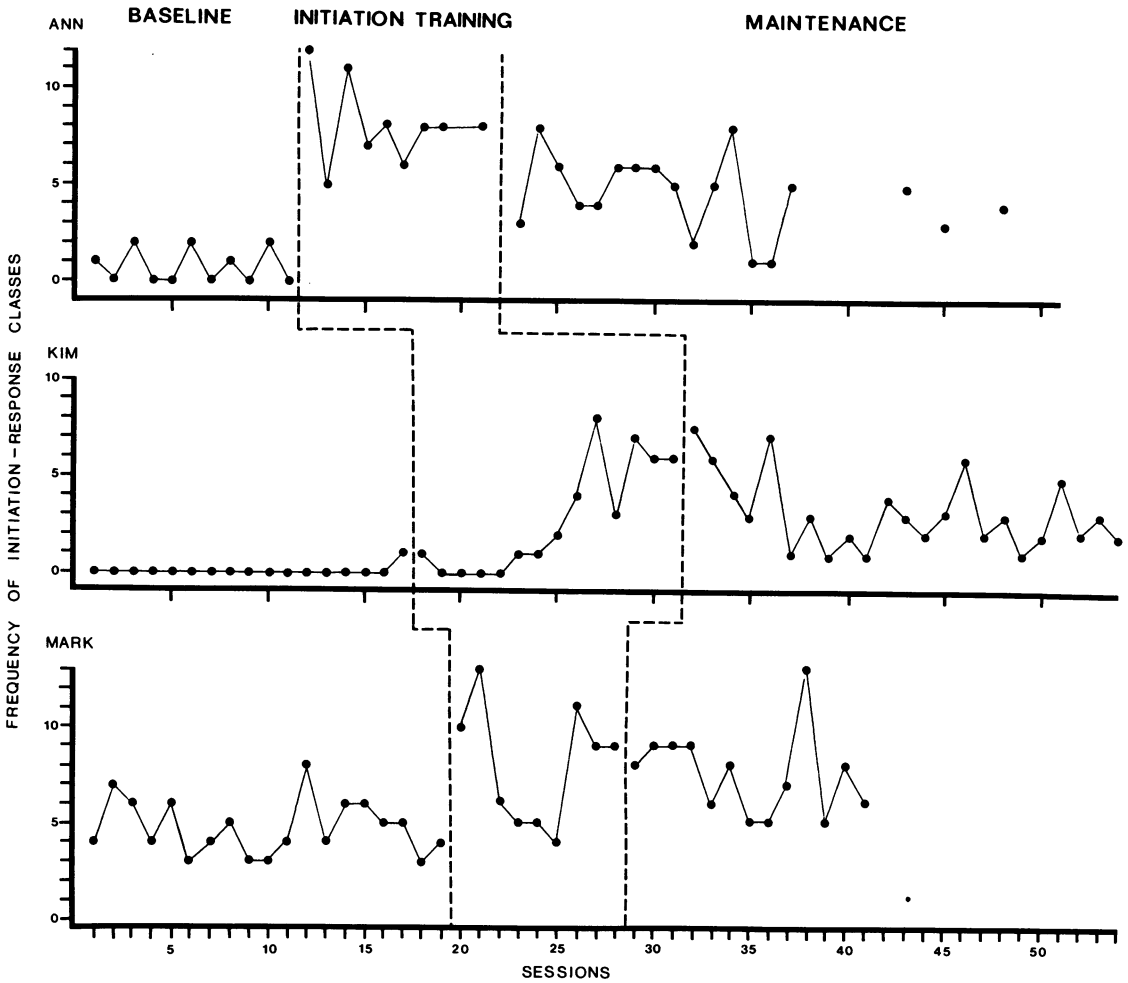


Figure 5. Frequency of initiation-response categories across the three subjects.

training based on deficits in behavior produced in role-play situations may not correspond to behavioral requirements in natural contexts. In our study, we selected all stimuli for training from the social conversation of nonhandicapped peers and used an instructional strategy that attempted to simulate natural conversations. The validity of the behavior taught was built into the training procedure on an a priori basis. In addition, the subjects had noticeable physical stigmata as well as behavioral deficits (as opposed to learning disabled subjects in the study by Berler *et al.*). Given the more severe nature of the handicaps experienced by the subjects in our study, it is possible that the standards used to judge the conversational attempts by these

handicapped subjects may have been far less severe than nonhandicapped students use when responding to subjects whose sole handicap (in the eyes of the nonhandicapped students) is social ineptness.

Several important issues are raised when categorical systems are developed for social communication data. Foremost is that categorical systems inherently impose some theory of social interaction into the data (Newson, 1977; Ochs, 1979). In the development of the system to code the subject's conversational responses into categories, we have attempted to keep the degree of such theoretical influence low by coding the responses according to basically discrete properties. Importantly, the system we used is based on a pragmatic analysis of

communication in that we attempted to determine the function of conversational responses within the context of the entire conversation. The intervention strategy used in this research was designed to increase the subjects' performance of two multioperant behaviors: initiations and expansions. Future research concerning complex interactional behaviors will undoubtedly identify other multioperant systems and provide a rich basis for extending behavior analysis.

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Received March 8, 1985

Final acceptance December 12, 1985