JOURNAL OF APPLIED BEHAVIOR ANALYSIS 1996, **29,** 291–304 NUMBER 3 (FALL 1996)

TRAINING AND GENERALIZATION OF AFFECTIVE BEHAVIOR DISPLAYED BY YOUTH WITH AUTISM

ANGELIKI GENA

QUEENS COLLEGE AND THE GRADUATE SCHOOL OF
THE CITY UNIVERSITY OF NEW YORK

PATRICIA J. KRANTZ AND LYNN E. MCCLANNAHAN

THE PRINCETON CHILD DEVELOPMENT INSTITUTE

AND

CLAIRE L. POULSON

QUEENS COLLEGE AND THE GRADUATE SCHOOL OF
THE CITY UNIVERSITY OF NEW YORK

The purpose of this study was to teach contextually appropriate affective behavior to 4 youths with autism. Treatment consisted of modeling, prompting, and reinforcement introduced in a multiple baseline design across response categories of affective behavior. During treatment, verbal praise and tokens were delivered contingent on appropriate affective responding during training trials. Modeling and verbal prompting were used as correction procedures. Each youth received treatment in either three or four response categories. Treatment systematically increased responding within the response categories for all 4 participants, with effects being specific to the affective response categories under treatment. Treatment effects occurred across untrained scenarios, therapists, time, and settings, suggesting that generalization had occurred.

DESCRIPTORS: affective behavior, response class formation, generalization, youth with autism

Affective behavior includes observable aspects of a person's facial, verbal, postural, and gestural response repertoires. When considered within the broader context in which they are emitted, affective responses can serve as discriminative stimuli for the use of such modifiers as *happy, sad, surprised, dismayed,* and *puzzled*—terms that are used to draw inferences about a person's emotional or physiological state. In this study, affective displays included facial and verbal components associated with affect that were congruent with the context in which they were emitted. Those affective components involved only observable responses that served a social-communicative function and had no necessary emotional or physiological correlates. The distinction between social-communicative and emotional or physiological correlates has been made by several researchers (Ekman, 1984; Izard, 1990). Because affective displays often serve as discriminative stimuli during social interactions (Rutter & Schopler, 1987), a deficit in displaying appropriate affect may retard overall social development and reduce the probability of successful interactions (Feldman, Philippot, & Custrini, 1991; Walters, Barrett, & Feinstein, 1990).

Children with autism demonstrate severe social skills deficits that include displays of

This research was supported by a Princeton Child Development Institute Fellowship to the first author. We extend our appreciation to Lillian Pelios, Meg MacDuff, and Mary Beth Kitson for their valuable assistance in this study.

Correspondence concerning this article should be sent to Angeliki Gena, Aigaiou 50, Nea Smyrni, Athens, GR-17124, Greece.

inappropriate affect (McGee, Feldman, & Chernin, 1991; Snow, Hertzig, & Shapiro, 1987). Many studies have compared the affect of children with autism, children with other developmental disabilities, and children with typical development. Results show consistently that children with autism compare unfavorably to these other groups (e.g., Dawson & Adams, 1984; Yirmiya, Kasari, Sigman, & Mundy, 1989). Failure to display appropriate affect tends to be independent of intellectual functioning and tends to persist indefinitely for people with autism if treatment is not provided (American Psychiatric Association, 1994; Hobson, 1989).

Behavior analysts have taught successful social or social-affective skills and have tested for generalization and maintenance of those skills (e.g., Lancioni, 1982; Odom, Hoyson, Jamieson, & Strain, 1985; Twardosz, Nordquist, Simon, & Botkin, 1983). The three training procedures used most frequently in these studies are reinforcement, modeling, and prompting, which often occurred in the form of instructions, behavioral rehearsal, peer modeling, modeling on videotapes, coaching, and homework assignments.

Even though there is extensive research in social skills training, we found no published studies that specifically addressed remediation of affective deficits in children with autism. Only three studies were found that taught children, in general, to show affect. In the first study, children with typical development were taught to display generalized imitative affection toward animate and inanimate objects following the introduction of reinforcement and correction procedures (Acker, Acker, & Pearson, 1973). In the second study, children with learning disabilities improved their social-emotional responding when instructions, modeling, and contingent social praise were used (Cooke & Apolloni, 1976). These results were maintained in the absence of intervention and generalized to untrained persons who interacted with the subjects. The third study compared the effectiveness of various procedures for teaching typical preschoolers to produce facial expressions upon request (Field & Walden, 1982). Providing photographic models was more effective than instructing the children to emit facial expressions.

The relative paucity of intervention studies that address teaching affect, combined with the severity of social-affective deficits in people with autism, underscore the need for further research in this area. The purposes of the present study were (a) to teach contextually appropriate affect to youth with autism using a combination of reinforcement, modeling, and verbal prompting; (b) to assess treatment effects on novel responses, across new therapists and new settings and during a 1-month follow-up; and (c) to train affective responses that were highly correlated with peer acceptance (La Greca & Santogrossi, 1980).

METHOD

Participants

Participants, who had been diagnosed with autism and presented a deficit in displaying appropriate affect, were enrolled in the Princeton Child Development Institute's Education Program. At the time of the first baseline session, participants were between the ages of 11 years 4 months and 18 years 11 months and had received 8 to 13 years of educational intervention and treatment at the institute. Participants were described by their teachers as having "flat" and inappropriate affect. All participants had received a behavior-reduction plan for laughing inappropriately. Tony obtained a test composite of 49 on the Stanford-Binet Intelligence Scale (4th ed.) and spoke in full sentences, with relatively clear articulation. Alex obtained a full-scale IQ of 46 on the Wechsler Intelligence Scale for Children—Revised (WISC–R), his expressive language was not

fluent, and his articulation was poor. Ana obtained a full-scale IQ of 58 on the WISC–R, spoke in full sentences, and had a short range of voice inflection. Dean obtained a test composite of 36 on the Stanford-Binet. His expressive language was often echolalic and dissociative, but he also had some functional language. All participants engaged in minimal stereotypic and disruptive behavior and were responsive to an existing token-reinforcement program and to therapist-directed instructions.

Setting and Therapists

Sessions were conducted at the institute in a classroom that was similar to but smaller than the participants' own classroom. During sessions, a participant and a therapist were alone in the classroom and sat face to face. Two desks (64 cm by 49 cm) were placed 10 cm away and to the right of the therapist. The desks were used to hold the data sheets, a token system (a chart with 24 boxes that were checked for each correct response), and materials (e.g., photographs and magazines) used during sessions. Two videocameras, mounted on tripods, were also used. A Panasonic® AG-450 videocamera was used to record the participant's front view and the therapist's side view and was placed on the corner diagonally across from the participant's seat. A General Electric X8 videocamera was used to record the therapist's front view and was placed facing the therapist. This arrangement permitted recording of the therapist and the participant separately and allowed for close-up shots of the therapist's and the participant's faces. Posttreatment measures were obtained in the participants' primary classroom, recreation area, and dining room of the institute. One primary therapist conducted all baseline and treatment sessions. Teachers who were familiar to the participants, but who did not conduct treatment, served as probes for responding across novel people.

Response Definitions

Independent observers judged whether participants' affective responding was contextually appropriate. Affective responses were scored as appropriate if they (a) included both verbal and facial characteristics described separately for each response category in Table 1, (b) were congruent with scenarios presented by therapists, and (c) were emitted within 5 s of presenting a scenario. If any of the above conditions was not satisfied, affective responding was not scored as appropriate. Thus, affective responses were trained as cluster responses that were contextually appropriate and included the specified facial and verbal components and eye gaze directed toward the therapist.

The participants received training in either three or four of the response categories listed in Table 1. The 2 participants who did not produce appropriate affect to show sympathy were trained in four instead of three response categories. The other 2 participants, who produced appropriate affect for showing sympathy, received training in three response categories, and their affective displays for showing sympathy were simply monitored. We considered it important to monitor affect associated with showing sympathy, because it required contrasting facial displays from the other response categories trained in this study and, as such, provided a broader index of participants' affective repertoire. The specific response categories on which each participant received training were selected according to their performance on a pretest that assessed the appropriateness of their responses on the response categories listed in Table 1. The response categories selected for each participant were those for which they demonstrated inappropriate affective responding.

Even though common response categories were trained across participants, the specific scenarios and the target verbal responses var-

Table 1
Definitions of Appropriate Affective Responding for the Five Response Categories

Response categories	Participants	Appropriate affective responses
Talking about favorite things	Tony Alex Ana Dean	Directing eye gaze toward therapist; providing appropriate verbal responses (e.g., "nice of you to ask"[a]; smiling or laughing while providing an appropriate verbal response.
Laughing about absurdities	Alex Ana Dean	Directing eye gaze toward therapist; providing appropriate verbal responses (e.g., "that's a silly question"); smiling or laughing while providing an appropriate verbal response.
Showing sympathy	Ana Dean	Directing eye gaze toward therapist; providing appropriate verbal responses (e.g., "that's sad," "I'm sorry to hear that"); maintaining a serious facial expression.[b]
Showing appreciation	Tony Ana Dean	Directing eye gaze toward therapist; providing appropriate verbal responses (e.g., "thank you," "no thank you"); smiling or laughing while providing an appropriate verbal response.
Indicating dislike	Tony Alex	Directing eye gaze toward therapist; providing appropriate verbal responses (e.g., "not really"); shaking head while providing an appropriate verbal response.

Note. More complete definitions with examples are available from the first author.
[a] For Dean only, any verbal response that was contextually correct was considered appropriate.
[b] Because Dean's serious facial expressions were often accompanied by immature and exaggerated responses, an exclusion criterion for those responses was added for the response category of showing sympathy.

ied across participants to match their preferences and expressive and receptive language skills. The following provides examples of scenarios from the response category of showing appreciation, selected to reflect different participants' preferences: "Do you want to borrow this tape?" (for a participant interested in music) and "Would you like to play basketball with me?" (for a participant interested in sports). The target verbal responses for both scenarios required an answer that shows appreciation, such as, "Thanks" or "Thank you." Trained responses were not always the same, even for the same scenario. For example, in response to the scenario, "Who is your favorite person?" he or she might be trained to respond, "My father is my favorite person" or "Nice of you to ask; my sister is my favorite person." The target facial displays were the same across participants, regardless of individualized verbal responses.

Scenarios

Scenarios consisted of brief statements or questions presented by the therapist, who simultaneously displayed contextually appropriate affect throughout all experimental phases. An example of presenting a scenario from the response category of showing sympathy was to say, "I have a terrible headache," and simultaneously to display a serious facial expression. The presentation of scenarios did not vary systematically between baseline and treatment sessions.

Each response category included 120 scenarios, of which 80 were randomly assigned to be used during training trials and 40 were assigned to probe trials. A large number of scenarios was used to promote generality of the results and to avoid habituation that might have resulted from frequent repetition of scenarios.

Procedure

General procedure. A trial consisted of the therapist presenting a scenario, waiting up to 5 s for a response, and delivering consequences that differed for baseline and treatment conditions. The therapist waited to present a scenario until the participant dis-

played a neutral facial expression. After presenting a scenario, the therapist made reciprocal statements based on participant responses during both baseline and treatment. For example, if a participant said, "Thanks for the magazine," the therapist might have responded, "Sure, any time."

Experimental sessions were videotaped, included 24 consecutive trials, lasted approximately 15 min, and were conducted 5 days per week. During each session, a total of 24 scenarios was used, consisting of six scenarios from each response category, four of which were presented during training trials and two during probe trials. Scenarios were presented in random order. There were 20 sets of scenarios that were repeated as needed in the same sequential order. Each set included different scenarios. Thus, the same set of scenarios was repeated after 20 sessions.

Experimental conditions and design. During baseline, the therapist presented a scenario as described above, praised the participant for attending and participating, and delivered a token with a 5-s delay following a response. Attending and participating were defined as appropriate in-seat behavior, complying with the therapist's instructions, and refraining from stereotypic behavior.

Treatment was introduced for each response category when the dependent measures showed a stable trend in the last five baseline sessions. During training trials, an error-correction procedure was used in which the therapist modeled an appropriate affective response and verbally prompted the participant to match the model. For example, if the participant said, "That's too bad," and simultaneously laughed in response to a scenario requiring sympathy, the therapist said, "Show me a serious face and say, 'that's too bad,'" while simultaneously modeling a serious facial display. The correction procedure was used from one to three times per trial when a participant displayed an inappropriate response. The therapist delivered a token contingent on every uncorrected appropriate affective response displayed within 5 s of presenting a scenario. During probe trials, tokens were independent of affect. Thus, tokens were presented 5 s after a response, and, as in baseline, they were delivered contingent on attending and participating. Affective responses emitted during probe trials were never reinforced or corrected. Tokens were exchanged for preferred magazines, snacks, or activities at the end of sessions. Only when a participant had received at least 23 tokens did he or she gain access to objects or activities that had been chosen at the beginning of sessions. When he or she received fewer than 23 tokens, less preferred snacks, magazines, or activities were provided.

A multiple baseline design across response categories was used to assess the effects of treatment on emitting appropriate affective behavior.

Generalization across therapists and settings. Therapists A, B, and C tested for generalization across people using procedures identical to those used in baseline. Therapist A also tested whether newly trained affective responses occurred in the three new settings using procedures identical to those used in baseline. Following the last treatment session, the primary therapist tested whether newly trained affective responses occurred in three settings other than the training setting at the institute. The therapist presented six scenarios per day to each participant during a 2-hr class. Presentation of scenarios was interspersed among other scheduled educational activities. Scenarios were presented when a participant initiated an interaction with the therapist, during activity transitions, or while participants engaged in nonacademic activities (e.g., leisure or lunch activities).

Seventy-two responses, equivalent to three experimental sessions, were presented to

each participant in the new settings. Tokens were delivered during training trials only if a token-reinforcement system was already in place in the designated setting. Thus, tokens were delivered in the regular classrooms, but not during trials conducted in the recreational area or in the dining room. Correction procedures were not used during sessions in settings other than the training setting.

One-month follow-up. Three follow-up sessions per participant were conducted by the primary therapist 1 month after the last treatment session for all participants except Dean, whose summer recess followed his last session. During that month, participants received no treatment for appropriate affect. The setting and procedures during follow-up were identical to those used during treatment.

Social validity. Social validation of treatment outcome was assessed by two groups of observers: participants' parents and graduate psychology students who were not familiar with the participants or with the purposes of the study. Independent observers watched videotaped vignettes that consisted of two scenes that depicted a participant responding to a scenario presented by the primary therapist. The scenes were randomly selected from the last three baseline and treatment sessions. The observers did not use a rating system; rather, they identified the scene of each vignette in which a participant provided the most socially appropriate response.

Interobserver agreement. The primary therapist and four other observers (a graduate student and three therapists who worked at the institute) conducted agreement checks on at least 33% of sessions corresponding to each experimental condition for each youth. Observers obtained 80% agreement in data collection before recording sessions independently. Interobserver agreement was based on point-by-point calculations of occurrences of the target responses (Kazdin, 1982). Across all participants, interobserver agreement on appropriate affective responding for all experimental conditions had a range of 96% to 100% for training and probe trials. The integrity of the facial expressions of the primary therapist was assessed to ensure that the primary therapist's facial expressions did not differ systematically during baseline and treatment. Two naive observers scored 64 videotaped vignettes of the primary therapist presenting various scenarios. Each vignette was presented twice, and the observers indicated whether it occurred during baseline or treatment. Interobserver agreement measures of the independent variables were always 100%.

Measures of the independent variable. Throughout the study and across participants, the primary therapist used contingent reinforcement and error-correction procedures during 0% of probe trials. For training trials, those procedures were used contingently during treatment and the 1-month follow-up 100% of the time. During sessions in new settings with the primary therapist, contingent reinforcement was provided during 65% of training trials, and correction procedures were not used. Therapists A, B, and C used reinforcement and correction procedures during 0% of probe and training trials across all experimental conditions.

Regarding the integrity of the independent variable, the affective responses of the primary therapist did not differ systematically between baseline and treatment conditions, as indicated by independent observers.

RESULTS

Figures 1 through 4 depict individual data during probe trials for each participant (training data are available upon request from the first author). Facial displays and verbal affective responses were trained for all

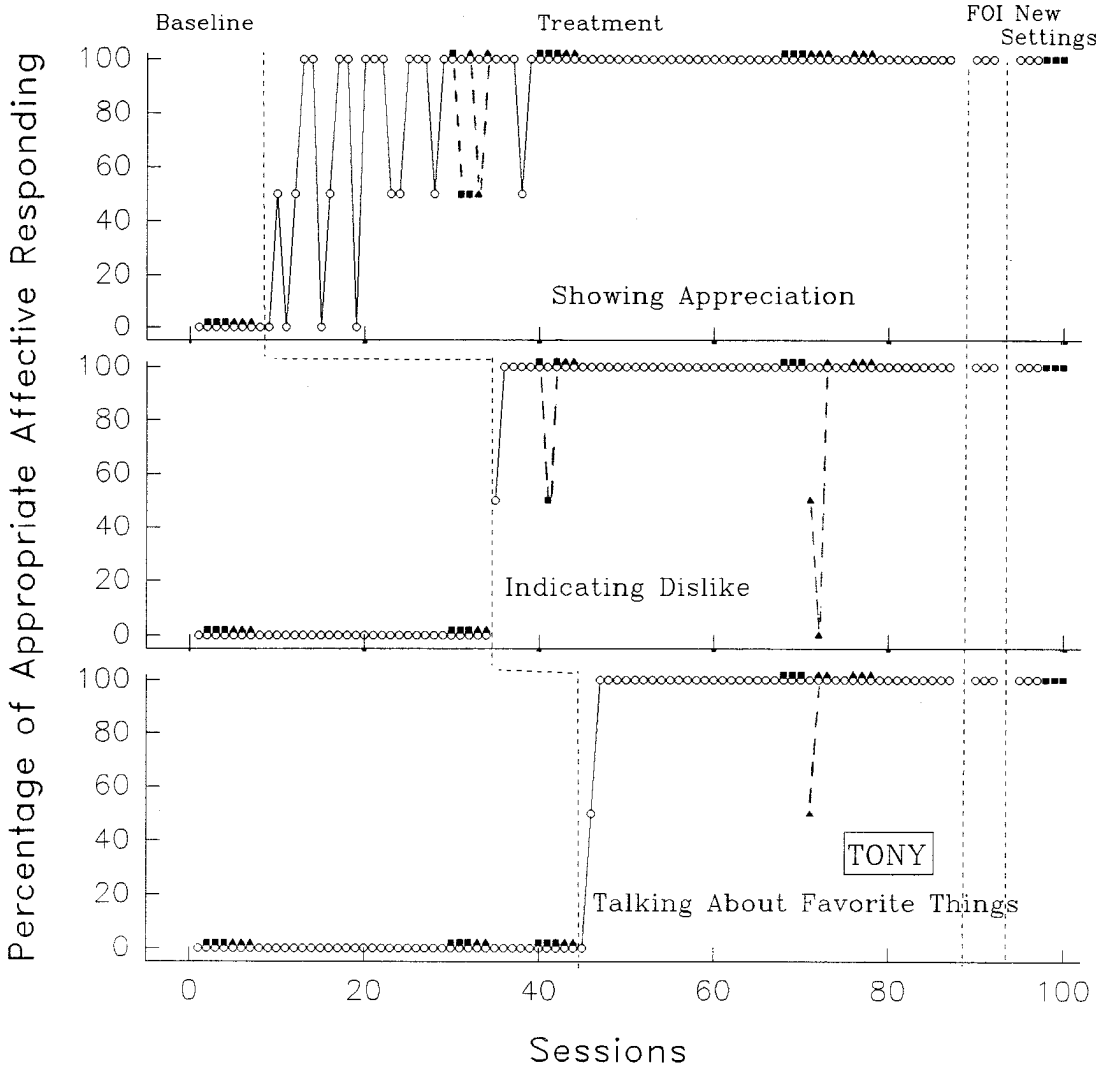

Figure 1. Percentage of appropriate affective responding produced by Tony during probe trials across experimental sessions conducted by the primary therapist (open circles), by Therapist A (filled squares), and by Therapist B (filled triangles).

participants; each participant displayed appropriate eye gaze during baseline. Figure 1 shows the percentage of probe trials in which Tony produced appropriate affect by response category over consecutive experimental sessions. During baseline, Tony emitted no correct responses across the response categories of showing appreciation, indicating dislike, and talking about favorite things. With the introduction of treatment, Tony's affective responding increased within two sessions to at least 50%. No generalized effect across response categories was apparent. Appropriate affective responding stabilized at 100% during the last three treatment sessions and during the 1-month follow-up for all response categories. Appropriate affective responding occurred 100% of the time during sessions conducted in settings other than the training setting and with novel therapists.

Similar findings were obtained with the

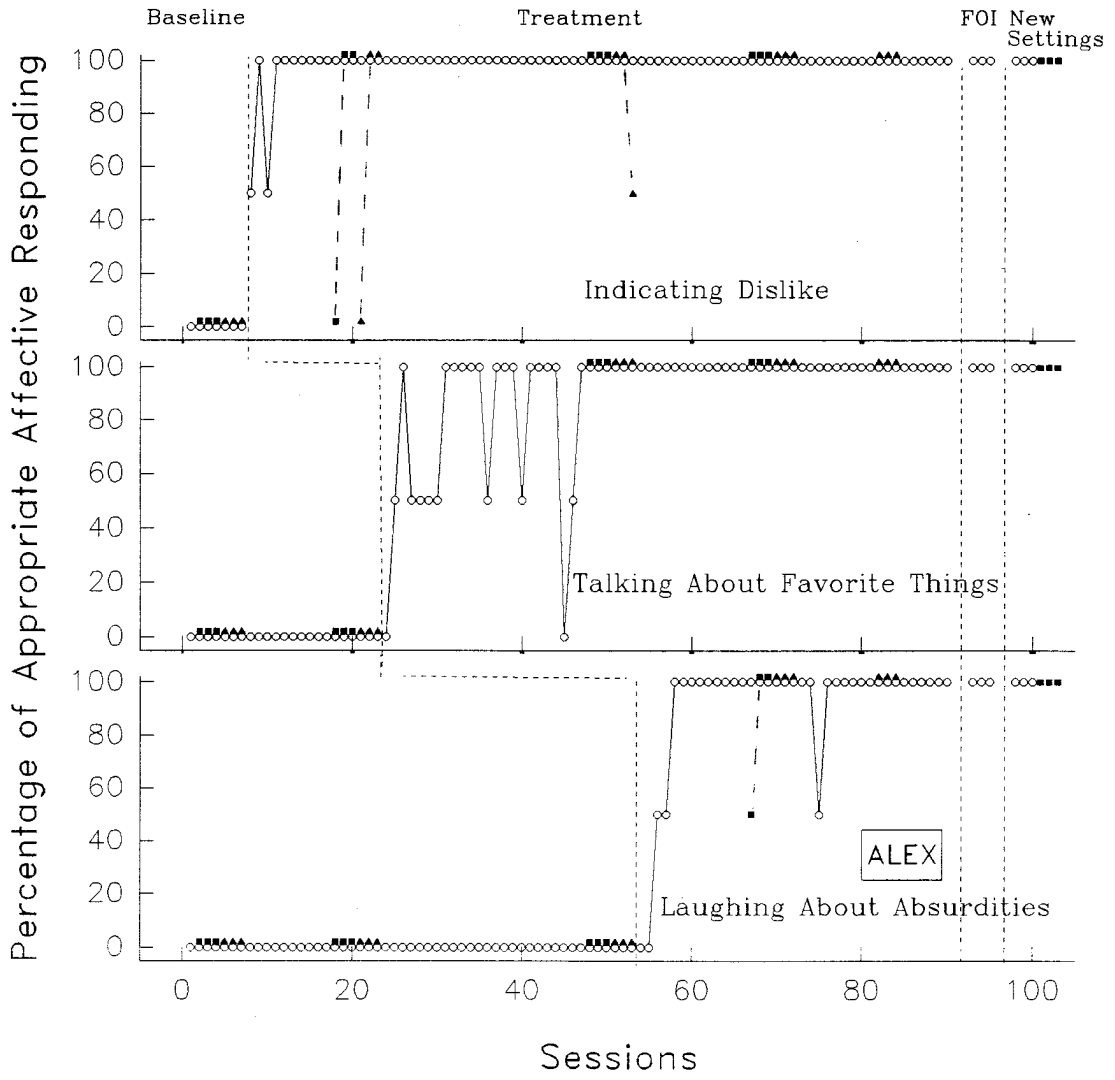

Figure 2. Percentage of appropriate affective responding produced by Alex during probe trials across experimental sessions conducted by the primary therapist (open circles), by Therapist A (filled squares), and by Therapist B (filled triangles).

other participants. Alex (Figure 2) also received training in three response categories: indicating dislike, talking about favorite things, and laughing about absurdities. Ana's data (Figure 3) are similar to Tony's and Alex's except for appropriate affective responding associated with showing sympathy, which decreased following the introduction of treatment for talking about favorite things and did not increase again until it was trained directly. Dean (Figure 4) did not display appropriate affect for showing sympathy during baseline; therefore, he received training in four instead of three response categories and showed acquisition in all categories following the introduction of treatment.

For the purposes of social validity, the percentages of affective responses scored as more socially appropriate by participants' parents during treatment, as opposed to baseline, had a range of 83% to 100% and

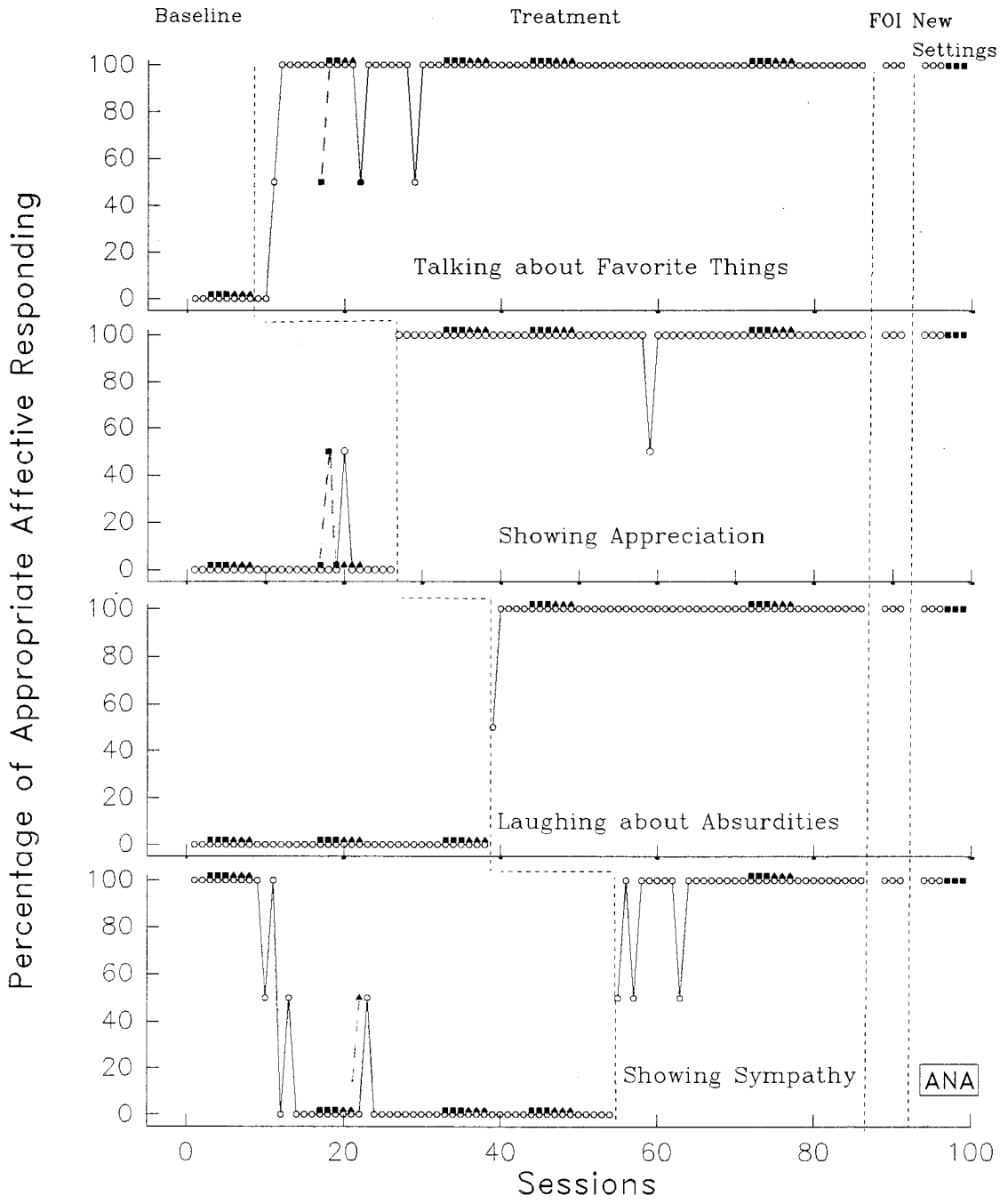

Figure 3. Percentage of appropriate affective responding produced by Ana during training and probe trials across experimental sessions conducted by the primary therapist (open circles), by Therapist A (filled squares), and by Therapist B (filled triangles).

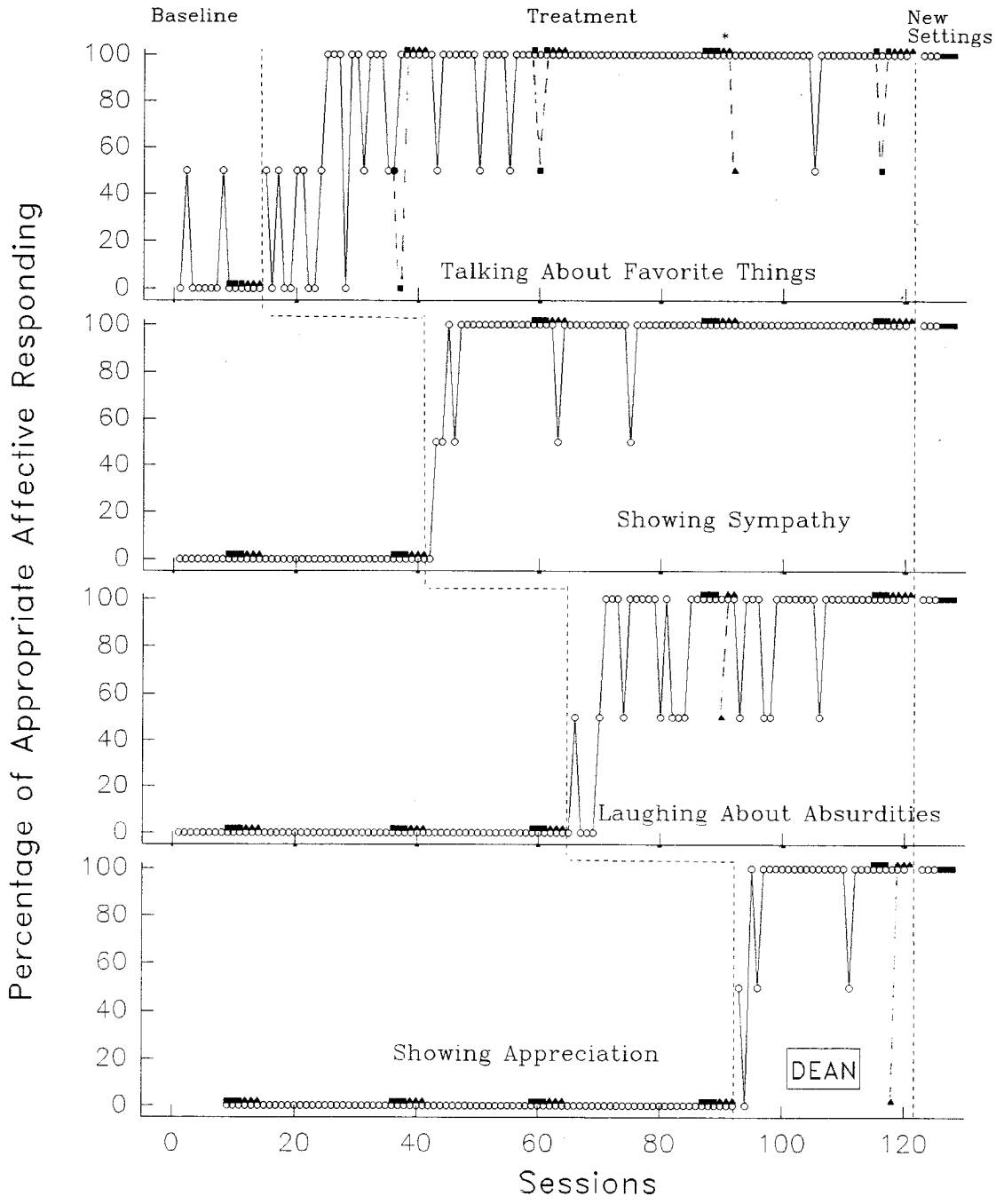

Figure 4. Percentage of appropriate affective responding produced by Dean during probe trials across experimental sessions conducted by the primary therapist (open circles), by Therapist A (filled squares), and by Therapists B and C (filled triangles).

an average of 92% across participants. The percentages of affective responses that were scored as more socially appropriate by 16 graduate students averaged 82% of 416 observations (range, 73% to 90%).

DISCUSSION

The combination of an error-correction procedure and contingent delivery of tokens produced contextually appropriate affect across three or four response categories per participant. In addition, displaying appropriate affect generalized to scenarios that were presented during probe trials in the absence of direct training. This generalization was specific to response categories under treatment. For example, when Tony was in treatment for showing appreciation, effects generalized to probe responses associated with showing appreciation, but not to responses from the categories of indicating dislike or talking about favorite things, for which treatment had not been introduced. Thus, it seems likely that training and probe responses that were associated with a specified response category formed functional response classes (Baer, 1982).

Overall, the findings indicate that affective displays of people with autism are modifiable using an operant paradigm. Although affective behavior may readily come under the control of respondent learning processes (Catania, 1992; Ekman, Friesen, & Ellsworth, 1982), this did not appear to be the case in the present study. Despite the therapist's models of appropriate affect in baseline, participants did not emit appropriate affect. With the introduction of treatment, however, appropriate affective responding increased immediately.

Teaching youths with autism to display contextually appropriate affect is a socially relevant response, because affective deficits may limit the opportunities of people with autism to communicate with others effectively and to develop relationships (McGee et al., 1991; Snow et al., 1987). The clinical importance of this study is further enhanced by the demonstration of treatment effects to new therapists and settings and their maintenance over time. Nevertheless, baseline measures were obtained only in the training setting rather than in all settings in which treatment effects were tested. In the absence of baseline measures in all settings, we do not have an experimental analysis of generalization effects. Based on anecdotal reports, however, it seems unlikely that participants would have displayed contextually appropriate affect in any setting before treatment was introduced.

Even though universal patterns of affective behavior have been identified by studies that have compared facial expressions of emotion across different cultures (e.g., Ekman, 1984; Ekman & Oster, 1979, 1982), the importance of cultural and other environmental factors in shaping affective behavior is undoubted. Examples of the importance of environmental factors may be drawn from studies of both individual differences within a culture and cross-cultural differences. Age, gender, and family background; parental or peer modeling; and one's learning history regarding affect are some variables that contribute to individual differences in affective behavior (Malatesta, 1982). On the other hand, various culturally determined "display rules" (Ekman, 1984) and cultural variations in the topography of affective displays (Davitz, 1964) contribute to cross-cultural differences in affect. For example, for Japanese, but not for Americans, displaying negative affect (such as frowning or showing dislike) in the presence of an authority figure is not socially acceptable (Ekman, 1984). Even though the question of which aspects of affective behavior are elicited and which are evoked by environmental stimuli is beyond the scope of this study, the present findings demonstrate that contextu-

ally appropriate affect may be taught like other operant behavior.

Displaying contextually appropriate affect requires complex discriminations based on other people's verbal and nonverbal affective behavior. The discriminative stimuli that occasioned affective responding by participants in the present study have not been identified through an experimental analysis. However, from informal observation, it is clear that the facial displays and voice intonation of the therapist had a greater effect on evoking contextually appropriate affect than did the content of the scenarios alone. Content alone, it seems, was not sufficient to evoke discriminated affective responding.

In addition to teaching contextual discriminations, shaping natural affective displays was also targeted. Discriminated affective responding required minimal training, but shaping the participants' affect during sessions to approximate their spontaneous affective displays required more training. Examples of topographically inappropriate affective responses included exaggerated facial displays (e.g., exaggerated smiling or shaking the head rapidly), speaking in a high pitch and high volume, and producing facial displays either before or after rather than simultaneously with an appropriate vocal response. By the end of the study, the participants' affective responses had improved, as indicated by social validity measures.

The social validity measures used in this study were relatively gross, because they neither addressed the extent to which participants' overall social interactions improved with improvement of their affect nor yielded a qualitative assessment of participants' affect (e.g., how appropriate or how deviant it appeared to be on a scale of 1 to 10). Another way of extending the social validity of acquiring appropriate affect would be to identify specific problem social situations and teach appropriate responses specific to those situations.

The present study did not address the prosodic features of vocal responding that may be important when judging the overall appropriateness of affective displays (Knapp, 1960); this would be an appropriate direction for future research. Furthermore, an important consideration regarding the treatment package of the present study is whether it would be sufficient to produce behavior change at home with parents serving as therapists. Identifying procedures that may improve affective displays in the home is essential for individuals with autism, who tend to avoid physical and eye contact with caregivers from a very early age (Sigman, Mundy, Sherman, & Ungerer, 1986). To the extent that individuals with autism avoid social interactions because they lack social skills, learning to display appropriate affect is a social skill that may promote interactions.

REFERENCES

Acker, L. E., Acker, M. A., & Pearson, D. (1973). Generalized imitative affection: Relationship to prior kinds of imitation training. *Journal of Experimental Child Psychology, 16,* 111–125.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

Baer, D. (1982). The imposition of structure on behavior and the demolition of behavioral structures. In D. J. Bernstein (Ed.), *Response structure and organization* (pp. 217–254). Lincoln: University of Nebraska Press.

Catania, A. C. (1992). *Learning.* Englewood Cliffs, NJ: Prentice Hall.

Cooke, T. P., & Apolloni, T. (1976). Developing positive social-emotional behaviors: A study of training and generalization effects. *Journal of Applied Behavior Analysis, 9,* 65–78.

Davitz, J. R. (1964). A review of research concerned with facial and vocal expressions of emotion. In J. R. Davitz (Ed.), *The communication of emotional meaning* (pp. 13–29). New York: McGraw-Hill.

Dawson, G., & Adams, A. (1984). Imitation and social responsiveness in autistic children. *Journal of Abnormal Child Psychology, 12,* 209–226.

Ekman, P. (1984). Expression and the nature of emotion. In K. R. Scherer & P. Ekman (Eds.), *Approaches to emotion* (pp. 319–343). Hillsdale, NJ: Erlbaum.

Ekman, P., Friesen, W. V., & Ellsworth, P. (1982).

What are the relative contributions of facial behavior and contextual information to the judgement of emotion? In P. Ekman (Ed.), *Emotion in the human face* (pp. 111–127). Cambridge: Cambridge University Press.

Ekman, P., & Oster, H. (1979). Facial expressions of emotion. *Annual Reviews of Psychology, 30,* 527–554.

Ekman, P., & Oster, H. (1982). Review of research, 1970–1980. In P. Ekman (Ed.), *Emotion in the human face* (pp. 143–173). Cambridge: Cambridge University Press.

Feldman, R. S., Philippot, P., & Custrini, R. J. (1991). Social competence and nonverbal behavior. In R. S. Feldman & B. Rime (Eds.), *Fundamentals of nonverbal behavior* (pp. 329–350). New York: Cambridge University Press.

Field, T. M., & Walden, T. A. (1982). Production and discrimination of facial expressions by preschool children. *Child Development, 53,* 1299–1311.

Hobson, R. P. (1989). Beyond cognition: A theory of autism. In G. Dawson (Ed.), *Autism: Nature, diagnosis, and treatment* (pp. 22–48). New York: Guilford.

Izard, C. E. (1990). Facial expressions and the regulation of emotions. *Journal of Personality and Social Psychology, 58,* 487–498.

Kazdin, A. E. (1982). *Single-case research designs.* New York: Oxford University Press.

Knapp, P. H. (1960). *Expression of the emotions in man.* New York: University Press.

La Greca, A. M., & Santogrossi, D. A. (1980). Social skills training with elementary school students: A behavioral group approach. *Journal of Consulting and Clinical Psychology, 48,* 220–227.

Lancioni, G. E. (1982). Normal children as tutors to teach social responses to withdrawn mentally retarded schoolmates: Training, maintenance, and generalization. *Journal of Applied Behavior Analysis, 15,* 17–40.

Malatesta, C. Z. (1982). The expression and regulation of emotion: A lifespan perspective. In T. Field & A. Fogel (Eds.), *Emotion and early interaction* (pp. 11–23). Hillsdale, NJ: Erlbaum.

McGee, G. G., Feldman, R. S., & Chernin, L. (1991). A comparison of emotional facial display by children with autism and typical preschoolers. *Journal of Early Intervention, 15,* 237–245.

Odom, S. L., Hoyson, M., Jamieson, B., & Strain, P. S. (1985). Increasing handicapped preschoolers' peer social interactions: Cross-setting and component analysis. *Journal of Applied Behavior Analysis, 18,* 3–16.

Rutter, M., & Schopler, E. (1987). Autism and pervasive developmental disorders: Concepts and diagnostic issues. *Journal of Autism and Developmental Disorders, 17,* 159–186.

Sigman, M., Mundy, P., Sherman, T., & Ungerer, J. (1986). Social interactions of autistic, mentally retarded and normal children and their caregivers. *Journal of Child Psychology and Psychiatry, 27,* 647–656.

Snow, M. E., Hertzig, M. E., & Shapiro, T. (1987). Expression of emotion in young autistic children. *Journal of the American Academy of Child and Adolescent Psychiatry, 26,* 836–838.

Twardosz, S., Nordquist, V. M., Simon, R., & Botkin, D. (1983). The effects of group affection activities on the interaction of socially isolated children. *Analysis and Intervention in Developmental Disabilities, 3,* 311–338.

Walters, A. S., Barrett, R. P., & Feinstein, C. (1990). Social relatedness and autism: Current research, issues, directions. *Research in Developmental Disabilities, 11,* 303–326.

Yirmiya, N., Kasari, C., Sigman, M., & Mundy, P. (1989). Facial expressions of affect in autistic, mentally retarded and normal children. *Journal of Child Psychology and Psychiatry, 30,* 725–735.

Received February 21, 1995
Initial editorial decision April 24, 1995
Revisions received August 20, 1995; November 20, 1995
Final acceptance April 12, 1996
Action Editor, Anthony J. Cuvo

STUDY QUESTIONS

1. In the introduction, the authors briefly mentioned several studies in which children were taught to display affective behaviors. In what ways did the authors propose to replicate and extend the findings of these studies?
2. The dependent variables consisted of five response categories, each of which included three elements. What were the three elements of affective behavior, and to what extent did they vary across response categories?
3. What were the scenarios, and how were they arranged and presented during baseline and training trials?
4. Describe how the authors assessed generalization.

5. Although results showed that all subjects acquired the appropriate affective behaviors during training, one negative outcome was observed. What was this outcome?
6. Briefly describe the results obtained with respect to generalization across (a) response categories, (b) therapists, and (c) settings. Also, describe how generalization across response categories may have been affected by the manner in which correct responses were scored.
7. How did the authors assess social validity? Can you suggest some additional methods that might have been used?
8. In the Discussion, the authors mentioned that future research should identify the stimuli that occasion contextually appropriate affective behavior. Elaborate briefly on what they meant.

Questions prepared by Han-Leong Goh and Jana Lindberg