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An Early Social Engagement Intervention for Young Children with Autism and their Parents

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Abstract

The social vulnerabilities associated with young children with autism are recognized as important intervention targets due to their influence on subsequent development. Current research suggests that interventions that combine motivational and social components can create meaningful changes in social functioning. Simultaneously, it is hypothesized that parent delivery of such strategies can invoke increases in these core social behaviors and parent engagement. This study examined the effects of teaching parents to implement a social engagement intervention with their children. The results indicated that the use of this parent-delivered social intervention led to (a) increases in their children's use of eye contact, directed positive affect, and verbal initiations, (b) increases in parent positive affect and synchronous engagement, and (c) generalized increases in parent and child behaviors.

Keywords

Social engagement; Social intervention; Autism spectrum disorders; Parent education; Pivotal response treatment

Introduction

In the study of autism, the social deficits associated with the disorder are often believed to be the core of the disorder (Volkmar 2011) and remain the most immutable and resistant to change. While tremendous strides have been obtained in the area of language acquisition and problem behavior, effective social interventions have struggled to gain similar therapeutic traction. This is perhaps due to the children's decreased innate desire for social interaction, sometimes described as the social motivation hypothesis of autism (Dawson et al. 1998, 2005; Grelotti et al. 2002; Scott-Van Zeeland et al. 2010). Whereas communication interventions can be facilitated using highly desired objects that entice children to make language requests, comparable strategies for social interventions often do not have an analogous motivator. Without the capacity to derive pleasure or reinforcement from the interaction itself, children on the spectrum may opt for more immediate gratification through non-social endeavors (e.g. sensory-motor stimulation or perseverative thematic interests).

Unfortunately, limited social interest has long-term implications for outcome. The notion that autism “begets” more autism is widely accepted understanding of the disorder (Jones and Klin 2009). The initial deficits associated with autism preclude or limit exposure to

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experiences necessary to acquire more advanced social-communicative and social-cognitive skills. As children with autism develop, they are continuously disadvantaged by lacking the prerequisite skills needed to access to the next stage of social competence and independent functioning. In a world in which most aspects of life—friendships, intimate relationships, marriage, and employment—depend on competence in interpersonal interaction, individuals with autism are at a clear disadvantage. As an unfortunate consequence of these impairments, individuals with autism spectrum disorders (even those without cognitive impairment) often exhibit limited autonomy and most remain reliant on caregivers as they enter adulthood (Levy and Perry 2011).

In addition to the direct effects on their long-term outcome, these social limitations often have an equally devastating effect on parents. A parent's perception of their child's social vulnerabilities and the experience of a limited personal connection are both likely to have a significant negative impact on parental wellbeing. Indeed, parents with children with autism endorse greater feelings of stress, depression, and hopelessness than those of typically developing children (Baker-Ericzén et al. 2005; Benson and Karlof 2009; Ergüner-Tekinalp and Akkök 2004; Montes and Halterman 2007). The challenges of raising a child with autism may carry the risk of affecting a parent's effectiveness in providing basic care and nurturance to both the individual child with the disability and the larger family unit (Soresi et al. 2007).

Partially due to the aforementioned reasons, parent involvement and education have emerged as important components within autism treatment. While the primary drive of parent participation is to provide additional therapeutic benefit for children, collateral benefits are also noted in the parents themselves. Parents participating in the treatment of their children exhibit decreased stress, increased signs of competence, and higher levels of affect (Brookman-Frazee 2004; Connell et al. 1997; Keen et al. 2010; Koegel et al. 1996). Parents bring a level of commitment, availability and personal expertise of their children that are invaluable assets. These traits, when combined with education in empirically supported treatments, have the potential to serve as a powerful therapeutic force in a child's intervention program.

When creating a parent education program, the type of treatment approach to use is an important consideration. Recently, research has focused on forging a connection between the preexisting interests of young children with autism and their social world (Koegel et al. 2009). By embedding a social component into children's pre-established activity of interest, collateral improvements in social behaviors (i.e., engagement, positive affect, dyadic orienting) were observed. Creating social equivalents of pre-existing non-social interests seemed to heighten the association between social interaction and pleasurable experiences. Within this paradigm, enhancing social motivation may be a method for helping children with autism to recognize the value of social interaction, seek out these experiences on subsequent occasions, and in doing so, possibly alter their social-developmental trajectory. If parents were involved in this intervention process, one could predict powerful collateral effects on their engagement as well.

The current study's objective was to examine the role of an embedded social intervention within a parent-delivery model in effecting change on both child and parent social behaviors. Specifically, the study assessed differences in child social responding when parents began to deliver language-learning opportunities that incorporated a social component into the child's existing interests. Additionally, this study sought to examine changes in parent behavior as a result of training in this intervention methodology.

Method

Participants

Three young children diagnosed with autism (autistic disorder) participated in this study. In addition, three parents (one per child) also participated in this study. All three children were diagnosed by outside agencies using the diagnostic criteria of the DSM-IV-TR (American Psychiatric Association 2000) and were referred to our autism center for intervention services. The authors confirmed their diagnoses through a combination of measures, including the Autism Diagnostic Observation Schedule (Lord et al. 2000), the Autism Diagnostic Interview-Revised (Lord et al. 1994), informal parent interviews and direct child observations. The child participants were selected on the basis of their (a) age, (b) social deficits, and (c) basic communication skills.

An age range criterion of 2–4 years was used. The children's social functioning level was a second selection criterion that was assessed through observation and a standardized parent-report measure. The children must be observed to rarely engage in eye contact or joint attention with their parents across all activities and contexts (less than 5 % of the time across probes). This criterion was verified during the initial meetings with the participant families during at least two separate parent–child video-taped observation probes during natural routines in the family home. The study used the Vineland Adaptive Behavior Scales, 2nd Edition (Vineland-II; Sparrow et al. 2005) as a standardized method for verifying the presence of adaptive social deficits. Participation in this study required that the age equivalence of Vineland-II interpersonal and play/leisure time socialization subdomains be less than half the child's chronological age and no greater than 18 months. The children's Vineland age equivalences are displayed in Table 1.

The final child selection criteria focused on basic communicative skills. The participant children were required to have basic imitation skills in that they could replicate verbal prompts in order to obtain a desired stimulus (i.e. they could repeat a parent's word model to obtain a preferred toy or object) and possess the use of some consistent functional language (i.e., a language repertoire of at least five words to request). The rationale for these criteria was the need for children to consistently respond to bids from their parents for various objects and activities used to elicit communicative and social behavior. One parent per child was selected to participate in the experiment. The first three children to meet all of the inclusion criteria were enrolled in the study. There was no attrition.

Child One—Child One was a 4-year, 3-month old Hispanic-American male. He lived in a multigenerational household with his biological parents, grandparents, and older brother. Observation revealed that Child One used one-word verbalizations consistently for behavior regulation purposes (requesting objects from others), but he was not observed to use words to comment or share enjoyment. His current intervention goals focused on expanding the length and complexity of his communicative phrases. He had participated in treatment for approximately 7 months with minimal social gains. He rarely made eye contact across family activities and routines. Child One's mother (Parent One) was a married 30-year-old Hispanic-American female.

Child Two—Child Two was a biracial (Hispanic- and European-American) male. He was a 2-year, 4-month old at the start of this study. He was an only child, and lived with both of his biological parents. At the start of the study, Child Two had approximately 20 single words that he used for requesting purposes. Current intervention goals focused on increasing his articulation and expanding the number of functional words in his vocabulary. He had participated in treatment for approximately 6 months with minimal increases in social behavior. He did not spontaneously use eye contact to seek out or share social experiences

with his parents. Child Two's mother (Parent Two) was a married 33-year-old Hispanic-American female.

Child Three—Child Three was a 2-year, 11-month old European-American. He was an only child and lived with both of his biological parents. He possessed a communicative repertoire of approximately ten words and primarily used words to request for food and his bottle. At the start of the study, his intervention goals focused on expanding his vocabulary and clarifying the quality of his speech attempts. He was observed to frequently pace around his home and have only fleeting interest in age appropriate toys. He had participated in treatment for approximately 5 months with minimal gains in his social behavior. Child Three's father (Parent Three) was a married 35-year-old European-American male.

Research Design

A multiple-baseline across participants design (Barlow and Hersen 1973) was used to evaluate the effects of the parent-delivered embedded social intervention.

Setting and Materials

Sessions took place in the participants' homes and community settings (parks, school playgrounds, etc.) Materials used during the study included motivating toys and other household items readily available in the participant homes to elicit social-communication from the participants.

Procedure

Prior to beginning of the baseline phase of the experiment, a survey of child-preferred reinforcing stimuli (i.e. toys, games, activities, etc.) was established by observing the child's play preferences during an observation session and interviewing the child's parent(s) about preferred items and activities. Because all sessions took place in the children's homes, they all had access to familiar, preferred reinforcing stimuli.

Each parent-education session across baseline and intervention phases was approximately 1 h in length and occurred 3–5 times a week depending on family availability. During each session, parent participants were provided with instruction and modeling of the intervention procedures. Following a 20–30 min parent-education instructional phase, a 10-min video clip probe of the adult-child teaching interaction was recorded for observational data collection and fidelity of implementation purposes. The video angle was continuously adjusted during the probe to ensure that coders could accurately view parent and child faces. Following this video probe, the parent was provided with feedback and additional training for the remaining time in the session. All dependent measures were coded from each video probes across baseline, intervention, and generalization sessions.

Across both the baseline and experimental phases, parent education focused on using a manualized treatment, Pivotal Response Treatment (PRT), to target social-communication with the participant child. All parent education sessions used this intervention model to set up and reinforce social-communicative opportunities. The specific motivational strategies of PRT used are described in detail in Koegel and Koegel (2006) and included the following strategies:

1. Using child choice to select the stimuli used within the social-communicative opportunity.
2. Attracting the child's attention to the stimulus prior to providing a clear opportunity to respond.

3. Reinforcing reasonable child attempts at responding (i.e. not requiring a perfect replication of the word prompt).
4. Providing reinforcement immediately and contingently following an appropriate attempt.
5. Using reinforcers directly, or logically, related to the child's verbal attempt at responding, (e.g. giving them a toy that matches their word attempt rather than using an arbitrary stimulus [edible or sticker] to reinforce their language).

Baseline Phase—During the baseline phase, opportunities took place in the following format: (a) the parent set up the social-communicative learning opportunity by signaling to the child the need to make a language attempt (i.e., providing a cue such as a verbal prompt or holding up an enticing object), (b) the child responded by making an appropriate verbal attempt, and (c) the child was reinforced for his verbal attempt with access to the *motivating object*. Following adequate time for the child to enjoy the reinforcing stimuli, another opportunity was created. In the event that a child verbally initiated for an item prior to the adult creating a learning opportunity, parents were instructed to reinforce the child's language immediately with access to the stimulus. Learning opportunity tasks were varied during the session to maintain the children's motivation. Examples of these interactions are listed in Table 2, which is adapted from Koegel et al. (2009).

Intervention Phase: Embedded Social Interaction—The introduction of the experimental condition began with the experimenter introducing the concept of embedded social interaction to the parent participants during the parent education session. Parents were instructed to continue providing PRT social-communicative opportunities to their child following the same general procedures; however, parents were taught to embed social interaction into the reinforcing stimuli. Opportunities took place in a format comparable to baseline, with the exception of the consequence phase of the sequence: (a) the parent set up the social-communicative learning opportunity by presenting a discriminative stimulus (e.g., providing a verbal prompt or enticing the child with a reinforcer), (b) the child made an appropriate verbal attempt, and (c) the child's verbal attempt was reinforced with a *motivating social interaction*.

Reinforcing social activities were created by embedding social interaction into child-preferred non-social interests. For example, if the child found engaging in self-stimulatory behavior by picking up and pouring sand through his fingers, a possible social activity might involve having a parent pick up a pile of sand and assist the child with pouring sand in a “social”-stimulatory activity following the child's request. As another example, if the child was reported to enjoy watching a video about various jungle animals, a possible social opportunity might involve having the parents verbally imitate the sounds and actions of these animals if the child responded to their prompts for “lion” or “tiger”. The primary concept was to turn the child's current non-social interests into interactive social activities. Motivating items (e.g. toys, furniture, blankets, and other household items) were used to facilitate the delivery of reinforcing actions (e.g. throwing a blanket around a child following his request).

Following the initial embedded social reinforcer parent-education session, the experimenter provided ongoing parent education in the experimental paradigm for 1-h sessions. Mirroring the format of the baseline sessions, parent education was provided for 20–30 min, followed by a 10-min video-taped probe of the parent–child embedded social reinforcement interactions. Following these video probes, feedback and additional training was provided for the remainder of the session. All participant families received a total 16 intervention sessions.

Generalization Probes—In both the baseline and experimental conditions, a 10-min probe was taken after every three session probes to assess for generalization of the parent's use of the social intervention strategies during their daily interactions with their child. To increase the validity of the generalization probes, they were never conducted immediately following a parent intervention session. All of these probes were scheduled to occur on separate days when the parent had not previously meet with the project's parent educator. A research staff member unfamiliar with the hypotheses of the study videotaped all of these probes. Parents were instructed to interact with their child as they would on a daily basis and were not given any further instructions about how to interact. The video probes were filmed in a manner identical to the recording of the baseline and intervention sessions (i.e. capturing parent and child faces) and scored for the dependent variables. Two follow-up generalization probes were gathered approximately 1 week after the end of the intervention phase. These final probes were used to assess the sustainability of treatment gains following the end of formal participation in the intervention study.

Fidelity of Implementation—Fifty percent of the probes (every other probe) from baseline, generalization, and intervention phases for each child/parent dyad were scored for PRT fidelity of implementation. Fidelity was scored on a trial-by-trial basis for the presence of the PRT components: child attention, clear opportunity, child choice, contingent reinforcement, natural reinforcement, and reinforcing attempts. In addition, two experimental components were scored in the fidelity: object reinforcement and social reinforcement. All parents scored well above the 80 % cutoff across the basic PRT fidelity components in both baseline and intervention conditions (group mean of 97.7 %). Additionally, parents were noted to adhere to using nonsocial reinforcement during the baseline condition (94.6 % of opportunities) and social reinforcement during the intervention condition (86.7 % of opportunities).

Dependent Variables

All dependent measures were coded from video probes using Noldus Observer behavioral coding software.

Reinforcer Strength (Opportunities with Child Requesting Reinforcer)—Because any observed changes in child social behavior could simply be the result of parents offering more powerful reinforcers in one condition versus the other, reinforcer strength was assessed as an internal validity safeguard to ensure that it remained relatively constant across experimental conditions. This measure ensured that the non-social stimuli used in the baseline condition had comparable reinforcer strength to the social stimuli used in experimental condition. In order to measure reinforcer strength, the number of trials in which the child actually verbalized for a parent-offered stimulus were divided by the total number of parent-initiated language opportunities to determine percent child responsivity.

Total Language Opportunities—This measure was included as another internal validity safeguard to ensure that changes in child social behavior across conditions were not simply due to parents providing a significantly higher number of total language learning opportunities in one condition versus the other. A parent-initiated learning opportunity were recorded with a time-stamped frequency count and defined as a parent verbalization (model of the target word or other verbal cue) that is intended to elicit their child's verbal response to obtain a reinforcer.

Child Eye Contact—As a measure of a child's level of social engagement with his parent, videos were coded on a continuous basis for the occurrence versus non-occurrence of eye contact. Child eye contact was defined as the child looking at the facial region of his parent's

face. For each probe, both (a) the total number of occurrences of eye contact and (b) total number of seconds in the probe with eye contact were counted.

Child Verbal Initiations—As another measure of social engagement, the children's verbal initiations towards their parents were recorded. A child verbal initiation was defined as any unprompted, functional verbal utterance towards a parent. Because of the interest in assessing spontaneous language production, verbal responses to a parent's initial word prompt (i.e., repeating a word modeled by a parent) were *not* included in this definition. Additionally, self-stimulatory and other nonfunctional vocalizations were not counted. Child initiations were recorded with a time-stamped frequency count.

Child Positive Affect—In order to ascertain a measure of overall social enjoyment, probes were scored on a continuous basis for the occurrence versus non-occurrence of directed positive child affect. Positive affect was defined as visible and/or audible indications of happiness and enjoyment, including smiling, laughing, and physical affection (hugging and kissing). Both the (a) total number of occurrences of child positive affect and (b) the total number of seconds with positive affect were calculated for each video probe.

Parent Positive Affect—Similar to the corresponding child measure, parent positive affect was coded for both (a) frequency of overall occurrences and (b) total duration as measures of parent social motivation. Parent positive affect was defined as visible and/or audible indicators of happiness and enjoyment, including smiling, laughing, using an elevated and playful vocal tone, clapping, and physical affection (i.e. hugging, kissing). This variable was scored on a continuous basis following the same procedure as child positive affect.

Synchronous Engagement—In order to ascertain data related to the extent that mutually reinforcing interactions occurred during the session probes, synchronous engagement was scored. Synchronous engagement is defined as time intervals in which both parent and child are simultaneously directing positive affect at one another while engaged in the same activity. This variable was scored on a continuous basis.

Reliability

Two independent observers recorded data for all dependent measures. Reliability was scored for approximately 33 % of all baseline, intervention, and generalization sessions. Inter-rater reliability is defined as the number of observer agreements divided by the total number of agreements and disagreements, yielding total percent agreement. Reliability was calculated using the Noldus Observer software.

In addition to calculating standard inter-rater reliability, kappa was calculated for all measures. Cohen's (1960) kappa is held to be a more robust measure of reliability than simple percent agreement, due to its ability to control for rater agreement occurring by chance. Kappa was also calculated using the Noldus Observer.

Reliability (and kappa) calculations were as follows: parent reinforcement (for calculating reinforcer strength) = 0.96 (0.79); parent initiated language opportunities = 0.92 (0.77); child eye contact = 0.87 (0.54), child verbal initiations = 0.90 (0.77); child positive affect = 0.85 (0.50); parent positive affect = 0.84 (0.56), synchronous engagement = 0.82 (0.52).

Results

Reinforcer Strength

In terms of reinforcer strength, Child One responded to a mean of 93.6 % (SD 8.1) of parent-initiated language opportunities in the baseline phase. As anticipated, during intervention this number remained relatively unchanged, with the child responding to a mean of 96.1 % (SD 3.8) of parent initiated opportunities. Child Two responded to lower rates of parent initiated language opportunities than Child One, with a mean of 60.4 % (SD 25.8) across his eight baseline probes and a mean of 87.3 % (SD 7.8) during intervention. Child Three responded to a mean of 71.7 % (SD 15.3) of parent initiated language opportunities during baseline and a mean of 82.2 % (SD 19.5) during intervention. The results of the reinforcer strength data are displayed in Fig. 1.

Total Language Opportunities

Parent One initiated a mean of 12.8 language opportunities (SD 3.9) during baseline. As anticipated, during the social interaction intervention, her mean number of initiated language opportunities remained comparable, with a mean of 14.8 (SD 5.0). During baseline, Parent Two initiated a mean of 18 language opportunities (SD 2.8). While in the social interaction intervention, Parent Two's initiated language opportunities occurred at comparable levels, with a mean of 20 (SD 6.3). Finally, Parent Three initiated a mean of 12.8 language opportunities (SD 3.9) during baseline probes. In the intervention phase, Parent Three's mean number of initiated language opportunities was 19.0 (SD 5.5). The results of the parent-initiated language opportunities data are displayed in Fig. 2.

Child Eye Contact

During his baseline probes, Child One's exhibited very low levels of eye contact, with an overall mean of 2.0 s (SD 2.6) across probes (mean of 1.8 separate incidents of eye contact). With the introduction of social intervention phase, Child One's eye contact increased to an overall mean of 47.7 s (SD 38.2), with a mean of 29.0 incidents of eye contact. Cohen's *d* calculations on total duration from baseline to intervention yielded a score of 1.20, which is indicative of a large effect. During generalization probes, Child One's exhibited 2.2 s during his baseline probe, a mean of 22.5 s during intervention (SD 32.5; 6 incidents), and a mean of 53.3 s of eye contact during follow-up probes (SD 32.5; mean of 20.4 incidents). During his eight baseline probes, Child Two also exhibited low levels of eye contact, exhibiting a mean of 6.5 s (SD 9.3; mean count of 4 separate incidents of eye contact). Following the introduction of the social intervention phase, Child Two's eye contact increased to an overall mean of 83.3 s (SD 37.8; mean of 26.7 incidents). The calculated effect size between baseline and intervention duration was 2.03, indicative of a large effect. During generalization probes, Child Two exhibited a mean of 2.3 s during baseline (SD 0.1; mean of 5 incidents), 60.7 s during intervention (SD 33.9; mean of 25.7 incidents), and 20.2 during follow-up (SD 6.5, mean of 12 incidents). Child Three's results followed a trend similar to the first two children, exhibiting a mean of 1.2 s of eye contact during baseline probes (SD 1.7; mean of 1.3 discrete incidents) and 19.0 s of eye contact during the social intervention phase (SD 16.3; mean of 16.9 incidents). Child Three's effect size score of 1.09 was indicative of a large effect. During generalization probes, Child Three exhibited a mean of 1.1 s of eye contact (SD 1.3; mean of 1.8 incidents), 8.0 s during intervention (SD 3.2; mean of 11.8 incidents), and 16.4 s during follow-up (SD 2.1; mean of 24.5 incidents). The results of the child eye contact duration data are displayed in Fig. 3.

Child Verbal Initiations

Child One exhibited a mean of 4.0 verbal initiations (SD 2.0) during baseline probes. After the introduction of the social intervention, his verbal initiations increased to a mean of 10.7 (SD 4.1). Intervention effect size calculations yielded a score of 1.62, which was indicative of a large effect. With regards to generalization probes, he made 6.0 initiations during baseline, a mean of 11.6 during intervention (SD 4.0), and 12.5 during follow-up (SD 10.6). During his eight baseline probes, Child Two made no (0) verbal initiations. After beginning the social intervention phase, his level of verbal initiations increased to mean of 3.1 (SD 2.5). Effect size calculations yielded a score of 1.21, which is indicative of a large effect. During generalization probes, he made a mean of 1.0 initiation during baseline (SD 1.4), 4.3 during intervention (SD 4.5), and 6.5 during follow-up (SD 0.7). Similar to the other two children, Child Three rarely made verbal initiations during baseline, with a mean of 0.4 across probes (SD 0.7). In the intervention phase, Child Three's verbal initiations increased to a mean of 4.7 (SD 3.6). Effect size calculations for Child Three's verbal initiations yielded a score of 1.18, which is indicative of a large effect. During generalization probes, he exhibited a mean of 0.8 initiations during baseline (SD 1.0), 0.4 during intervention (SD 0.6), and 2.0 during follow-up (SD 1.4). The results of the child verbal initiations data are displayed in Fig. 4.

Child Positive Affect

Child One rarely exhibited positive affect during his four baseline probes, with a mean of 1.7 s (SD 1.9; mean count of 1.8 separate incidents of positive affect). Following the introduction of the social intervention, Child One's positive affect increased a mean of 211.8 s (SD 77.6; mean of 23.9 incidents). Intervention effect size calculations of changes in duration yielded a score of 2.71, which is indicative of a large effect. During his generalization probes, he exhibited positive affect during 6.5 s of his baseline probe (5 incidents of positive affect), a mean of 137.7 s during intervention (SD 32.5; mean of 22.8 incidents), and 157.5 s during follow-up (SD 9.5; mean of 21.5 incidents). Child Two also exhibited low levels of positive affect during baseline probes, with a mean of 19.5 s (SD 9.0; mean count of 5.3 incidents). His positive affect increased to a mean of 151.6 s (SD 60.0; mean of 18.7 incidents) across social intervention probes. Intervention effect size calculations for duration yielded a score of 2.35, which is indicative of a large effect. During his generalization probes, Child Two exhibited a mean of 23.9 s of positive affect during baseline (SD 0.1; mean of 11.5 incidents), 112.9 s during intervention (SD 57.1; mean of 22.0 incidents), and 134.8 s during follow-up (SD 57.9; mean of 17.5 incidents). Like the first two participants, Child Three exhibited low levels of positive affect during his twelve baseline probes, with a mean of 4.3 s (SD 6.4; mean count of 2.2 discrete incidents of positive affect), and increased levels following the introduction of the social intervention, with a mean of 88.1 s (SD 64.5; mean of 13.4 incidents). Child Three's change in positive affect duration from baseline to intervention was indicative of a large effect, based on a Cohen's *d* calculation of 1.07. Generalization probes yielded a mean of 8.4 s of positive affect during baseline (SD 8.3; mean of 4.3 incidents), 38.0 s during intervention (SD 12.5; mean of 11 incidents), and 109.6 s during follow-up (SD 98.4; mean of 22.0 incidents). The results of the child positive affect duration data are displayed in Fig. 5.

Parent Positive Affect

Parent One exhibited relatively low levels of positive affect during the four baseline probes, with a mean of 6.5 s across probes (SD 3.6; mean count of 5 separate incidents of positive affect). Following the introduction of the parent embedded social interaction intervention, her positive affect increased to a mean of 66.3 s (SD 17.1; mean of 38.9 incidents). Intervention effect size calculations for duration yielded a score of 3.51, indicative of a large effect. During generalization probes, Parent One exhibited positive affect for 10.1 s of her

baseline probe (6 incidents), a mean of 52.5 s during intervention (SD 26.2; mean of 31.8 incidents), and a mean of 61.7 s during follow-up generalization (SD 21.2; mean of 24.5 incidents). Parent Two also exhibited low levels of positive affect during baseline with a mean of 6.7 (SD 3.8; mean of 4.6 separate incidents). Her positive affect increased to a mean of 56.5 s across all intervention probes (SD 23.6; mean of 24.7 incidents). Intervention effect size calculations for total duration yielded a score of 2.11, which is indicative of a large effect. During generalization probes taken during baseline, Parent Two exhibited a mean of 17.5 s of positive affect (SD 12.5; mean of 13.5 incidents), which increased to means of 63.0 s (SD 28.5; mean of 26.5 incidents) during intervention and 70.6 s (SD 9.8; mean of 25.0 incidents) during follow-up generalization. Finally, Parent Three initially exhibited very low levels of positive affect, a mean of 2.6 s across baseline probes (SD 3.7; mean of 1.1 separate incidents of positive affect). Following the start of intervention, his positive affect increased to a mean of 18.0 s (SD 14.4; mean of 11.7 separate incidents). Parent Three's change in positive affect duration from baseline to intervention was indicative of a large effect, based on a Cohen's *d* calculation of 1.07. Generalization probes yielded a mean of 1.9 s of parent positive affect during baseline (SD 2.2; mean of 0.8 incidents), 14.4 s during intervention (SD 9.3; mean of 10.2 incidents), and 25.2 s during follow-up (SD 17.2; mean of 22.5 incidents). The results of the parent positive affect data are displayed in Fig. 6.

Synchronous Engagement

During baseline, Family One was not observed to exhibit any synchronous engagement (mean of 0 s). During intervention, their synchronous engagement increased to a mean of 44.3 s (SD 14.0). The baseline to intervention data yielded an effect size score of 3.15, which is indicative of a large effect. Generalization probes yielded 1.6 s of synchronous engagement during the baseline generalization probe, a mean of 29 s during the intervention generalization probes (SD 16.4) and a mean of 39.1 s during follow-up (SD 41.0). Family Two was engaged in very low levels of synchronous engagement during baseline, with a mean of 0.8 s across probes (SD 1.5). During intervention, their synchronous engagement increased to a mean of 36.0 s (SD 21.7). The baseline to intervention data yielded an effect size score of 1.62, which is indicative of a large effect. They engaged in synchronous engagement for a mean of 1.0 s of baseline generalization probes (SD 0.1), 33.1 s during intervention generalization probes (SD 25.7), and 45.7 s of follow-up generalization probes (SD 6.4). Similar to Family One, Family Three exhibited no synchronous engagement during baseline (mean of 0 s). During intervention, their synchronous engagement increased to a mean of 8.5 s (SD 11.0). The baseline to intervention data yielded an effect size of 0.78, which is indicative of a large effect. They engaged in no synchronous engagement (mean of 0 s) during baseline generalization probes, and engaged for a mean of 5.3 s during the intervention generalization probes (SD 6.4) and 12.5 s of follow-up generalization probes (SD 11.3). The results of the synchronous engagement data are displayed in Fig. 7.

Discussion

The results indicate increases in all measured areas of social functioning, including child eye contact, verbal initiations, and directed positive affect. Simultaneously, parent positive affect and synchronous engagement was observed to increase. Finally, these social behavior increases were present in generalization probes taken without the presence of the training clinician during intervention and follow-up.

In terms of the internal validity control variables, reinforcer strength remained comparable across conditions for Child One and Three. In the case of Child Two, he responded to a slightly higher percentage of language opportunities in the intervention phase; however, his corresponding social behavior data (i.e., eye contact, verbal initiations, positive affect) were

noted to increase by a magnitude much greater than the proportion of the change in reinforcer strength. Overall, these data suggest that observed changes in social behavior were not simply due to parents offering stronger reinforcers (regardless of their inherent social qualities). In terms of total language opportunities, comparable numbers were noted across conditions for Parents One and Two. A slight increase in total opportunities was noted between baseline and intervention phases in Parent Three's data, but as with reinforcer strength, corresponding child social behavior was noted to change by a magnitude much greater than the change observed in total language opportunities. These findings suggest that changes in social behavior were unlikely to be the result of the parent simply flooding his child with an increased number of language learning opportunities in the intervention phase. The available evidence suggests that embedding a social component into learning opportunities is likely responsible for the increase in observed social engagement behaviors.

This study's findings provide additional evidence for the potential power of increasing social motivation as a primary intervention strategy, which aligns with the belief that motivation may serve as a pivotal area of development (Koegel et al. 2010; Schreibman and Ingersoll 2005). It has been hypothesized that the limited social attention observed in children with autism may be due to the difficulty perceiving the reward value of social interaction (Dawson et al. 2002). Thus, teaching a rote set of skills that only topographically represent a desired social response (e.g. prompting and arbitrarily reinforcing a child for making eye contact with a social partner) is likely a misguided approach to establishing generalizable changes in this domain (Yoder and McDuffie 2006). Instead, increasing the social value of a stimulus may be a more natural means to elicit the desired social behavior. In other words, the participants are motivated to the point that they are naturally inclined to use eye contact, verbal initiations, and directed smiles/laughter to share this experience with their social partner. In this conceptualization, children with autism are viewed not as fundamentally indifferent to social interaction, but simply as less sensitive to available social stimuli. Once we identify and introduce social activities with adequate salience to exceed their higher baseline social threshold, one can elicit a complex set of social responses that closely resemble those of typically developing children.

Research has demonstrated that young children with autism prefer to orient towards non-social, physical contingencies to the detriment of the typically observed preference for biological motion (Klin et al. 2009; Shultz et al. 2011). These researchers concluded that this is evidence of a core social behavior having been derailed, with critical implications for future development. In this current study, a possible interpretation of the treatment mechanism is a merging of the preferred physical, cause-and-effect contingency with the less-preferred biological (social) stimuli. It is hypothesized that perceiving the reward value of interaction is difficult for children with autism because such social stimuli is more variable and less predictable than its often immediate non-social counterparts, such as cause-and-effect toys (Dawson and Lewy 1989). Many of the social activities in this current study took advantage of a high degree of immediate audio, visual, and physical synchrony as parents animated toys, produced auditory stimuli (e.g. songs and playful noises), and engaged in physical play routines. In essence, these parents provided their children with rewarding social actions that were consistent, predictable, and contained physical contingency—all elements noted to elicit a higher degree of responding in children with autism. Through continued exposure to these motivating contingencies over time, children with autism may start to perceive social interaction to be a worthwhile endeavor and in doing so, possibly modify their social developmental trajectory.

The changes observed in synchronous engagement between parent–child dyads were also encouraging. Synchrony, or the interwoven series of shared playful behaviors between parent and child, is believed to be a critical developmental phenomenon (Feldman 2003,

2007). Child arousal is believed to be at a peak, and this positive arousal is purported to cause accelerated learning of relational, self-regulatory, and emotional skills. The social deficits associated with autism spectrum disorders often prevent children from engaging in these critical moments of development. The emergence of these playful, connected moments within the context of this study suggests that the children may be learning the value of interactive experiences with their parents.

Synchronous engagement allows children to experience repeated, patterned interactions with their parents. Through these exchanges, these behavioral patterns become internalized and shape the child's development (Feldman 2007). A longitudinal study by Siller and Sigman (2002) found that when parents showed high levels of synchronization with their children, their children developed better joint attention skills in the short-term measures and better language skills in the long-term measures than families with lower levels of interactive synchrony.

Synchrony and the related joint attention skills enable powerful social experiences that provide a foundation for multiple skills, including language, affective attunement, regulation, empathy, theory of mind, and social learning (Mundy and Acra 2006; Raver 1996; Tomasello 1995). In the current study, the participant parents to seem to be identifying effective ways to establish this social foundation.

The study's findings also suggest that parents found some aspect of the intervention personally rewarding, which is consistent with previous parent education research incorporating motivational strategies (Schreibman et al. 1991). These changes may be attributed to observing the positive responses of their children. Because of the severity of the social deficit profiles of the participant children, these findings are especially promising, as they suggest that a level of parent–child engagement was established that did not exist before. The data also provide evidence that parents found this to be a socially valid intervention approach. Specifically, the increase in parent positive affect seems to be a direct indicator that they enjoyed implementing this intervention with their children. Additionally, they continued to use embedded social interaction strategies during generalization probes taken during intervention and follow-up. These observations are perhaps even more encouraging than any immediate social gains noted, as they imply that the parents acquired a set of treatment strategies that they will use to provide ongoing social intervention to their children. Overall, this study adds to the growing literature on the use of parent training as an effective intervention modality for children with ASD (e.g., Kaiser et al. 2000; Koegel et al. 1998; Laski et al. 1988; Roberts et al. 2011; Schreibman and Koegel 2005).

Interestingly, there was a noted difference between the relatively large gains in social behavior observed in Families One and Two and the more modest gains observed in Family Three. There are a number of plausible explanations for these differences. As one hypothesis, they could be attributed to differences in parent personality and interactive style. For example, Parent Three was anecdotally reported to be an interpersonally “serious” individual who was more reserved in his interactions with his child. While he exhibited some increases in positive affect during the intervention phase, the duration and frequency of his affect data were relatively less pronounced than those of the other participant parents. Whether this was due to socialization factors related to fathers being less forthcoming with displays of affect (Gordon and Feldman 2008; McDowell and Parke 2005) or simply a difference in his personal interactive style, there was a decreased presence of parent positive affect, which may serve as an essential ingredient for promoting child social engagement (c.f. Feldman 2003). It is also possible that perhaps Child Three was less responsive to the existing affective bids of his father, making it more difficult to build “social momentum” and decreasing the likelihood of future displays of parental affect over time. Families One

and Two may have met a certain “threshold” of playful interactions in order to generate strong, sustainable social momentum. With regards to Family Three, they may be operating below such a critical threshold, which subsequently limited the social gains of both parent and child participants. A possible clinical implication of these results would be to encourage, model, and teach more reserved parents to initially over-exaggerate their affective responding in order to encourage in-kind responding from their children. By providing exaggerated social bids, parents may help their children attend to the relevant social cues in their environment and become more engaged as a result. Despite the modest nature of the social gains observed in Family Three, it is still encouraging that both parent and child made clinically significant improvements in their use of key social behaviors.

The findings of this current research, while promising, must be tempered by the limitations of the study's sample size and relatively short duration of treatment. Group design methodology and additional single-subject design replications are necessary to more thoroughly understand the utility of this treatment approach. Additionally, while the results and preliminary generalization data presented in this current study are encouraging, long-term follow-up measures are needed to examine the generalizability and permanency of observed social gains. While clear changes were observed in terms of observable social behavior, other measures of progress (e.g. standardized assessment data) are needed and remain the focus of future research.

Finally, although child and parent social behavior were both noted to increase concurrently, we must be cautious of making any undue causal claims. For example, based on these data, we cannot claim with absolute certainty that increases in child social behavior *caused* an increase in parent social behavior (or vice versa). For example, it is plausible that in some cases, a child and parent could both be responding to a motivating third stimulus that evokes an increase in their respective social behaviors without any interactive causation per se. While the synchronous engagement data suggest that there are clear moments of shared social enjoyment, these data only provide information on one aspect of the social interaction. A moment-by-moment sequential analysis of child and parent behaviors would be a necessary step (and a future research direction) to better understand the causal mechanisms behind the observed changes in social behavior.

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References

American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4th edn, text revision. Author; Washington, DC: 2000.

Baker-Ericzén MJ, Brookman-Frazee L, Stahmer A. Stress levels and adaptability in parents of toddlers with and without autism spectrum disorders. Research and Practice for Persons with Severe Disabilities. 2005; 30(4):194–204. doi:10.2511/rpsd.30.4.194.

Barlow DH, Hersen M. Single-case experimental designs: Uses in applied clinical research. Archives of General Psychiatry. 1973; 29(3):319–325. [PubMed: 4724141]

Benson PR, Karlof KL. Anger, stress proliferation, and depressed mood among parents of children with ASD: A longitudinal replication. Journal of Autism and Developmental Disorders. 2009; 39(2):350–362. doi:10.1007/s10803-008-0632-0. [PubMed: 18709548]

Brookman-Frazee L. Using parent/clinician partnerships in parent education programs for children with autism. Journal of Positive Behavior Interventions. 2004; 6(4):195–213. doi: 10.1177/10983007040060040201.

Cohen J. A coefficient of agreement for nominal scales. Educational and Psychological Measurement. 1960; 20(1):37–46. doi:10.1177/001316446002000104.

Connell S, Sanders MR, Markie-Dadds C. Self-directed behavioral family intervention for parents of oppositional children in rural and remote areas. Behavior Modification. 1997; 21(4):379–408. doi: 10.1177/01454455970214001. [PubMed: 9337598]

Dawson G, Carver L, Meltzoff AN, Panagiotides H, McPartland J, Webb SJ. Neural correlates of face and object recognition in young children with autism spectrum disorder, developmental delay and typical development. Child Development. 2002; 73(3):700–717. doi:10.1111/1467-8624.00433. [PubMed: 12038546]

Dawson, G.; Lewy, A. Arousal, attention, and the socioemotional impairments of individuals with autism.. In: Dawson, G., editor. Autism: Nature, diagnosis, and treatment. Guilford Press; New York: 1989.

Dawson G, Meltzoff AN, Osterling J, Rinaldi J, Brown E. Children with autism fail to orient to naturally occurring social stimuli. Journal of Autism and Developmental Disorders. 1998; 28(6): 479–485. doi:10.1023/A:1026043926488. [PubMed: 9932234]

Dawson G, Webb SJ, McPartland J. Understanding the Nature of Face Processing Impairment in Autism: Insights From Behavioral and Electrophysiological Studies. Developmental Neuropsychology. 2005; 27(3):403–424. doi:10.1207/s15326942dn2703_6. [PubMed: 15843104]

Ergüner-Tekinalp B, Akkök F. The effects of a coping skills training program on the coping skills, hopelessness, and stress levels of mothers of children with autism. International Journal for the Advancement of Counselling. 2004; 26(3):257–269. doi:10.1023/B:ADCO.0000035529.92256.0d.

Feldman R. Infant–mother and infant–father synchrony: The coregulation of positive arousal. Infant Mental Health Journal. 2003; 24:1–23.

Feldman R. Parent-infant synchrony and the construction of shared timing; physiological precursors, developmental outcomes, and risk conditions. Journal of Child Psychology and Psychiatry. 2007; 48:329–354. [PubMed: 17355401]

Gordon I, Feldman R. Synchrony in the triad: A microlevel process model of coparenting and parent-child interactions. Family Process. 2008; 47(4):465–479. [PubMed: 19130788]

Grelotti DJ, Gauthier I, Schultz RT. Social interest and the development of cortical face specialization: What autism teaches us about face processing. Developmental Psychobiology. Special Issue: Converging method approach to the study of developmental science. 2002; 40(3):213–225. doi: 10.1002/dev.10028.

Jones W, Klin A. Heterogeneity and homogeneity across the autism spectrum: The role of development. Journal of the American Academy of Child and Adolescent Psychiatry. 2009; 48(5): 471–473. doi:10.1097/CHI.0b013e31819f6c0d. [PubMed: 19395902]

Kaiser AP, Hancock TB, Nietfeld JP. The effects of parent-implemented enhanced milieu teaching on the social communication of children who have autism. Early Education and Development. 2000; 11:423–446.

Keen D, Couzens D, Muspratt S, Rodger S. The effects of a parent-focused intervention for children with a recent diagnosis of autism spectrum disorder on parenting stress and competence. Research in Autism Spectrum Disorders. 2010; 4(2):229–241. doi:10.1016/j.rasd.2009.09.009.

Klin A, Lin DJ, Gorrindo P, Ramsay G, Jones W. Two-year-olds with autism fail to orient towards human biological motion but attend instead to non-social, physical contingencies. Nature. 2009; 459:257–261. [PubMed: 19329996]

Koegel RL, Bimbela A, Schreibman L. Collateral effects of parent training on family interactions. Journal of Autism and Developmental Disorders. 1996; 26(3):347–359. doi:10.1007/BF02172479. [PubMed: 8792265]

Koegel, RL.; Koegel, LK. Pivotal response treatments for Autism: Communication, social, & academic development. Paul H Brookes Publishing; Baltimore, MD: 2006.

Koegel, RL.; Koegel, LK.; Vernon, TW.; Brookman-Frazee, LI. Empirically supported pivotal response treatment for children with autism spectrum disorders.. In: Weisz, J.; Kazdin, A., editors. Evidence-based psychotherapies for children and adolescents. 2nd ed.. Guilford Press; New York: 2010. p. 327-344.

Koegel LK, Stiebel D, Koegel RL. Reducing aggression in children with autism toward infant or toddler siblings. Journal of the Association for Persons with Severe Handicaps. 1998; 23(2):111–118.

Koegel RL, Vernon TW, Koegel LK. Improving social initiations in young children with autism using reinforcers with embedded social interactions. Journal of Autism and Developmental Disorders. 2009; 39(9):1240–1251. doi:10.1007/s10803-009-0732-5. [PubMed: 19357942]

Laski KE, Charlop MH, Schreibman L. Training parents to use the Natural Language Paradigm to increase their autistic children's speech. Journal of Applied Behavior Analysis. 1988; 21:391–400. [PubMed: 3225256]

Levy A, Perry A. Outcomes in adolescents and adults with autism: A review of the literature. Research in Autism Spectrum Disorders. 2011; 5(4):1271–1282. doi:10.1016/j.rasd.2011.01.023.

Lord C, Risi S, Lambrecht L, Cook EH Jr, Leventhal BL, DiLavore PC, et al. The autism diagnostic observation schedule-generic: A standard measure of social and communication deficits associated with the spectrum of autism. Journal of Autism and Developmental Disorders. 2000; 30(3):205–223. [PubMed: 11055457]

Lord C, Rutter M, Le Couteur A. Autism diagnostic interview-revised: A revised version of a diagnostic interview for caregivers of individuals with possible pervasive developmental disorders. Journal of Autism and Developmental Disorders. 1994; 24(5):659–685. [PubMed: 7814313]

McDowell DJ, Parke RD. Parental control and affect as predictors of children's display rule use and social competence with peers. Social Development. 2005; 14(3):440–457.

Montes G, Halterman JS. Psychological functioning and coping among mothers of children with autism: a population-based study. Pediatrics. 2007; 119(5):e1040–e1046. doi:10.1542/peds.2006-2819. [PubMed: 17473077]

Mundy, P.; Acra, CF. Joint attention, social engagement, and the development of social competence.. In: Marshall, PJ.; Fox, NA., editors. The development of social engagement. Oxford University Press; New York: 2006.

Raver CC. Relations between social contingency in mother– child interaction and 2-year-olds' social competence. Developmental Psychology. 1996; 32:850–859.

Roberts J, Williams K, Carter M, Evans D, Parmenter T, Silove N, et al. A randomised controlled trial of two early intervention programs for young children with autism: Centre-based with parent program and home-based. Research in Autism Spectrum Disorders. 2011; 5(4):1553–1566. doi:10.1016/j.rasd.2011.03.001.

Schreibman, L.; Ingersoll, B. Behavioral interventions to promote learning in individuals with autism.. In: Volkmar, F.; Paul, R.; Klin, A.; Cohen, D., editors. Handbook of autism and pervasive developmental disorders, Vol. 2: Assessment, interventions, and policy. 3rd ed.. Wiley; Hoboken, NJ: 2005. p. 882-896.

Schreibman L, Kaneko WM, Koegel RL. Positive affect of parents of autistic children: A comparison across two teaching techniques. Behavior Therapy. 1991; 22(4):479–490. doi:10.1016/S0005-7894(05)80340-5.

Schreibman, L.; Koegel, RL. Training for parents of children with autism: Pivotal responses, generalization, and individualization of interventions.. In: Hibbs, ED.; Jensen, PS., editors. Psychosocial treatments for child and adolescent disorders: Empirically based strategies for clinical practice. 2nd ed.. American Psychological Association; Washington, DC: 2005. p. 605-631.

Scott-Van Zeeland AA, Dapretto M, Ghahremani DG, Poldrack RA, Bookheimer SY. Reward processing in autism. Autism Research. 2010; 3(2):53–67. [PubMed: 20437601]

Shultz S, Klin A, Jones W. Inhibition of eye blinking reveals subjective perceptions of stimulus salience. Proceedings of the National Academy of Science of the United States of America. 2011 Epub ahead of print. doi:10.1073/pnas.1109304108.

Siller M, Sigman M. The behaviors of parents of children with autism predict the subsequent development of their children's communication. Journal of Autism and Developmental Disorders. 2002; 32(2):77–89. [PubMed: 12058846]

Soresi S, Nota L, Ferrari L. Considerations on supports that can increase the quality of life of parents of children with disabilities. Journal of Policy and Practice in Intellectual Disabilities. 2007; 4(4): 248–251. doi:10.1111/j.1741-1130.2006.000 87.x.

Sparrow, SS.; Cicchetti, DV.; Balla, DA. Vineland Adaptive Behavior Scales. 2nd ed.. American Guidance Service; Circle Pines, MN: 2005.

Tomasello, M. Joint attention as social cognition.. In: Moore, C.; Dunham, P., editors. Joint attention: Its origins and role in development. Lawrence Erlbaum; Hillsdale, NJ: 1995. p. 103-130.

Volkmar FR. Understanding the social brain in autism. Developmental Psychobiology. 2011; 53(5): 428–434. doi:10.1002/dev.20556. [PubMed: 21678390]

Yoder, PJ.; McDuffie, AS. Treatment of responding to and initiating joint attention.. In: Charman, T.; Stone, W., editors. Social & communication development in Autism spectrum disorders: Early identification, diagnosis, & intervention. Guilford Press; New York: 2006. p. 117-142.

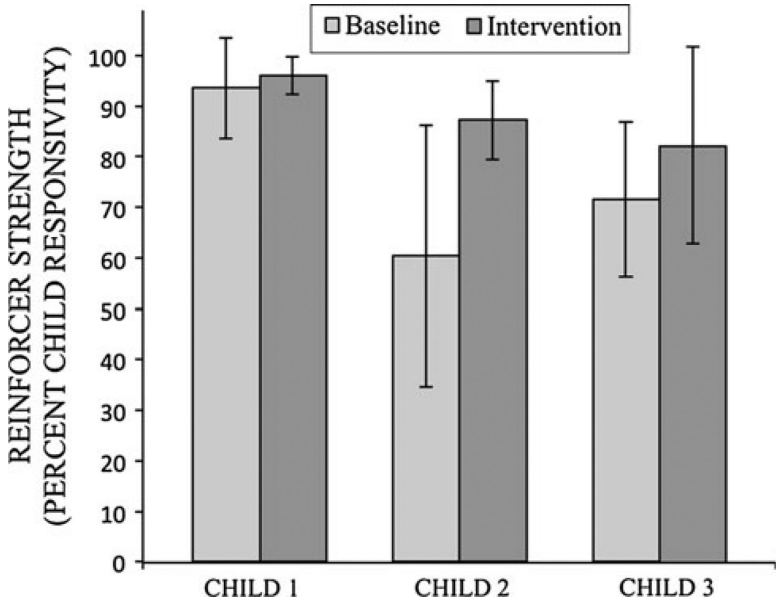

Fig. 1.
Reinforcer strength: percent responsivity to language opportunities for all child participants

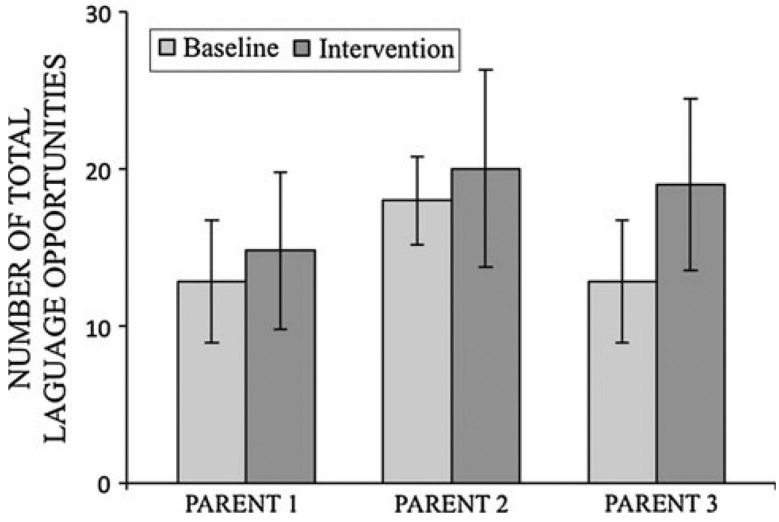

Fig. 2.
Number of initiated language opportunities for all parent participants

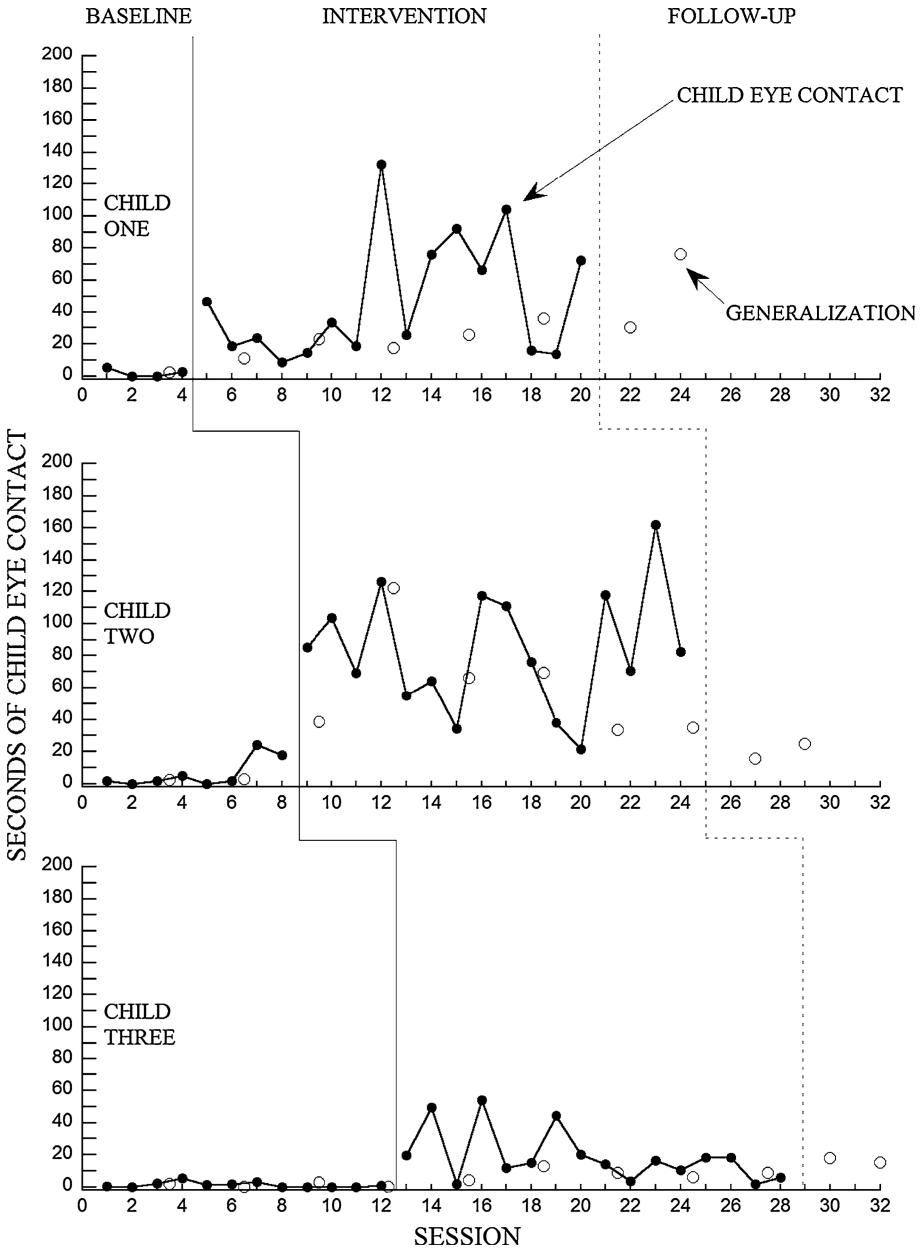

Fig. 3.
Seconds of eye contact for all child participants

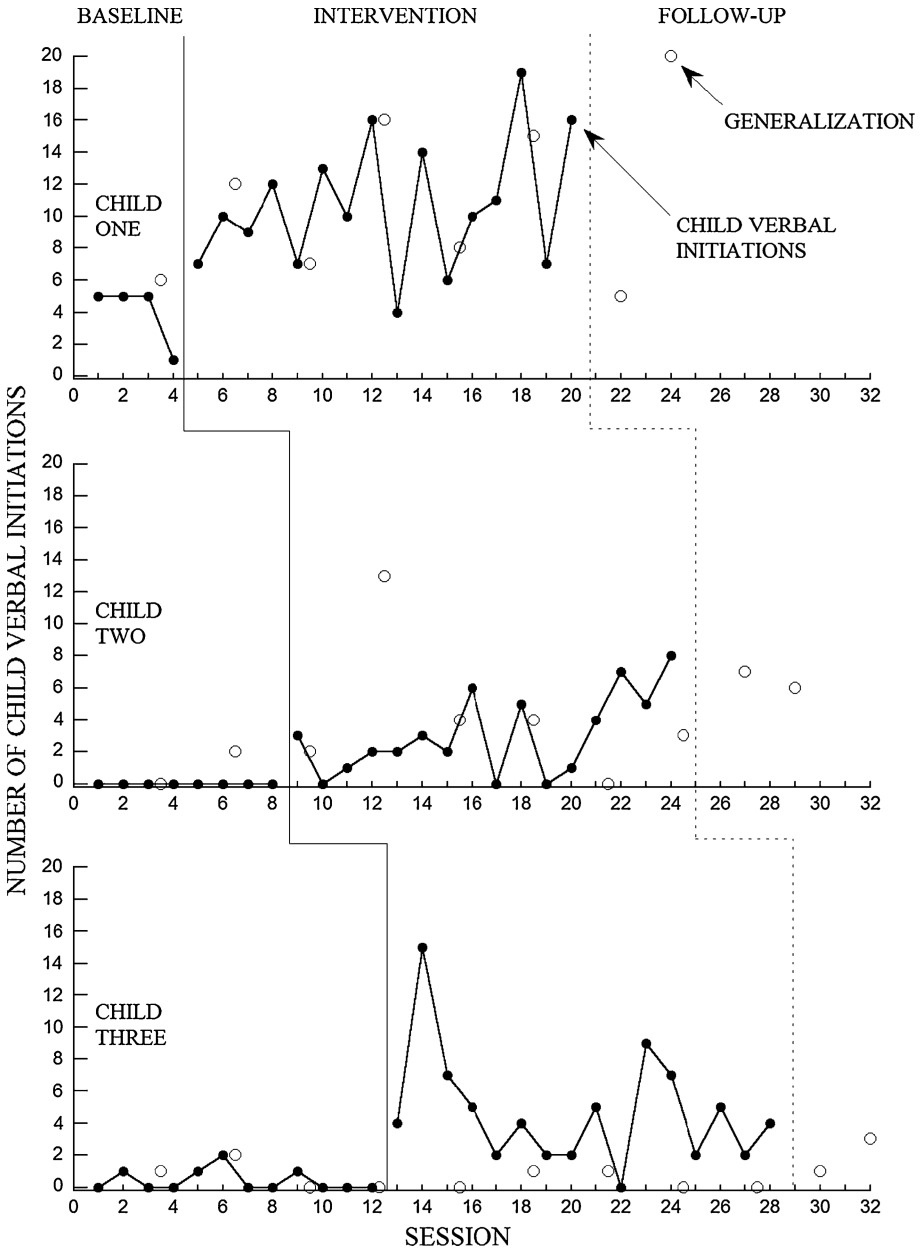

Fig. 4.
Number of verbal initiations for all child participants

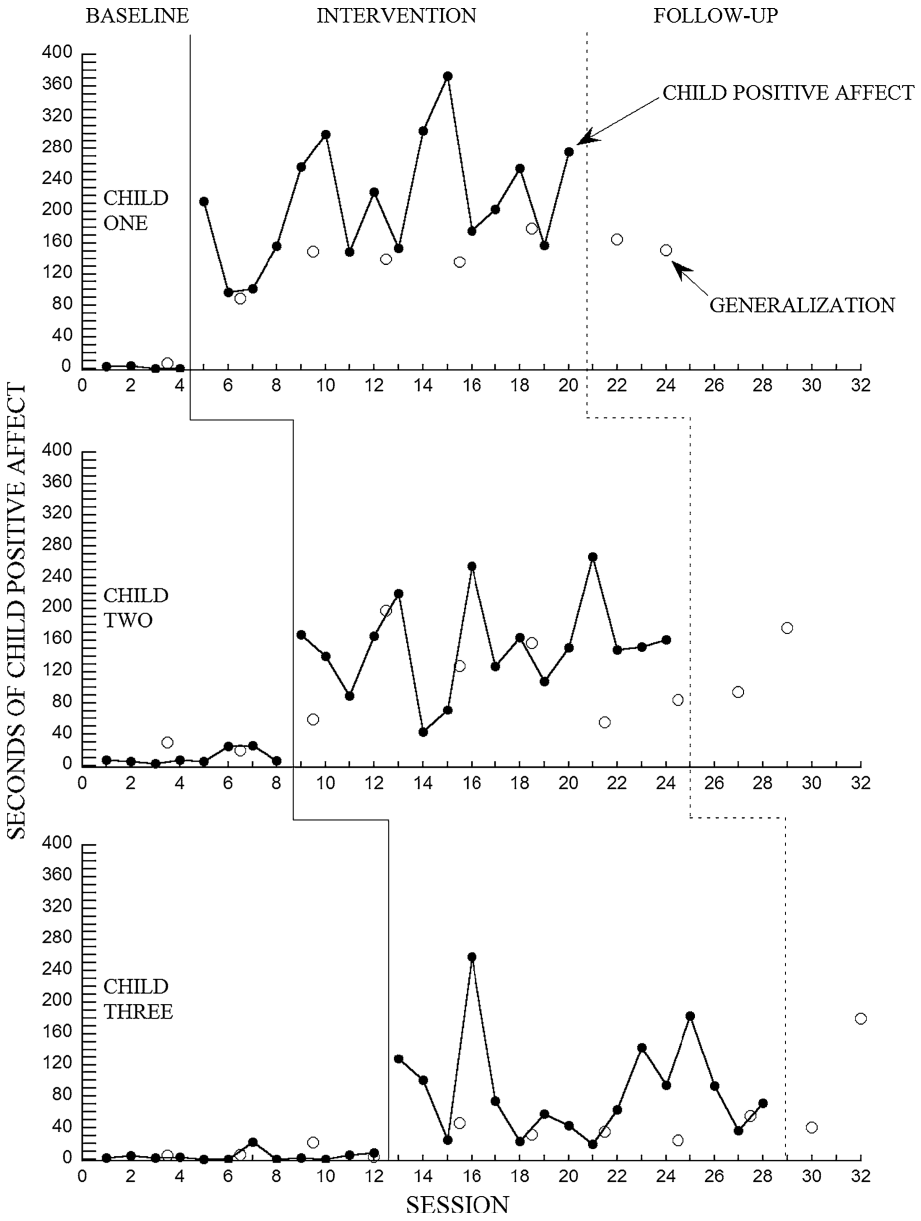

Fig. 5.
Seconds of child positive affect for all child participants

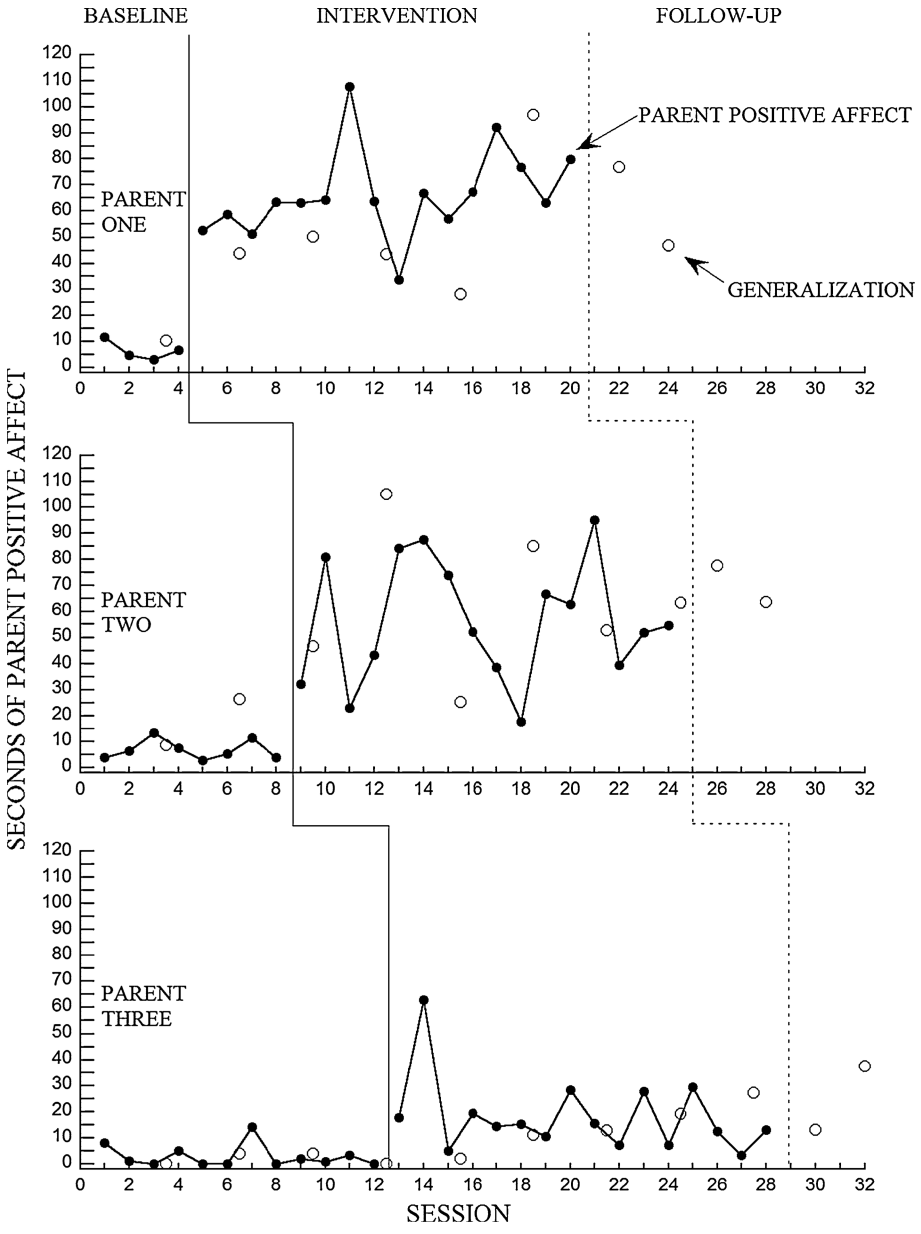

Fig. 6.
Seconds of positive affect for all parent participants

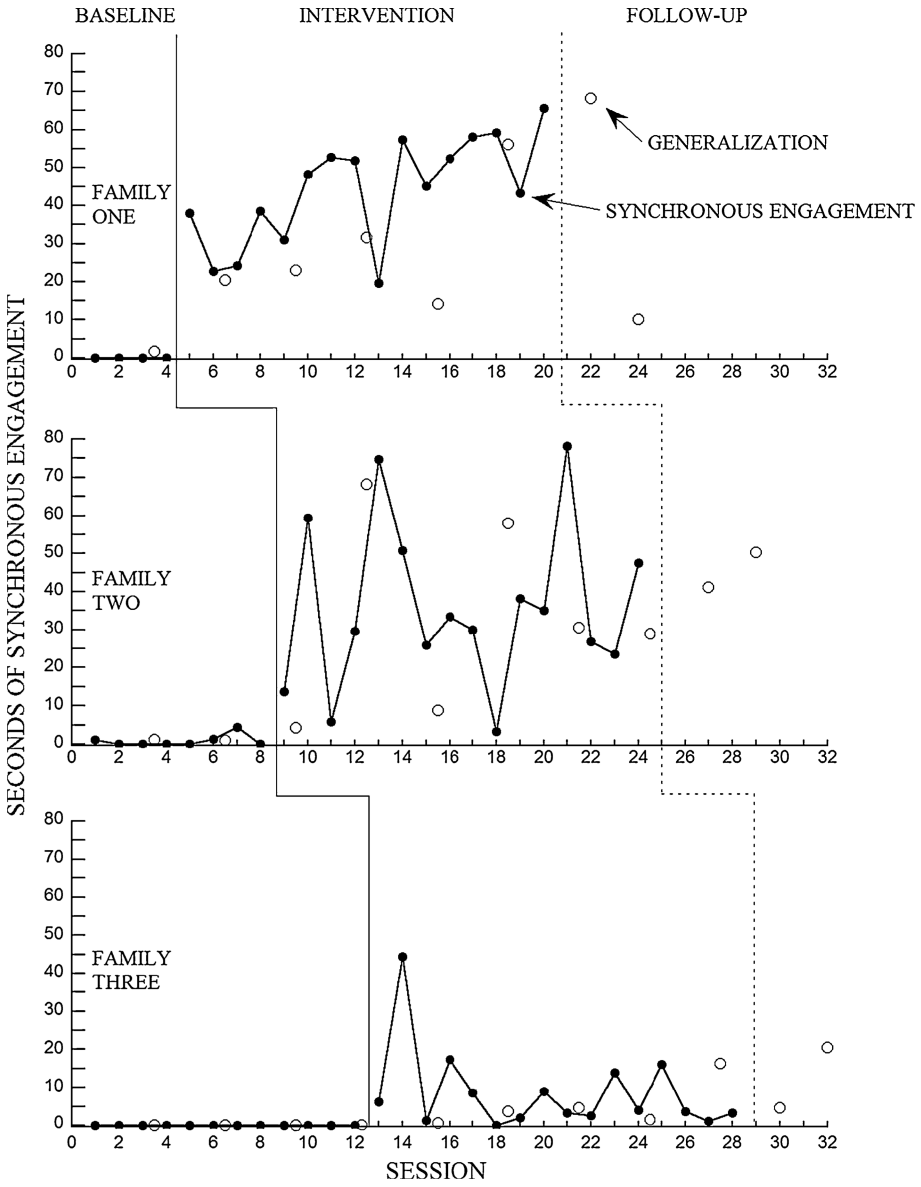

Fig. 7.
Seconds of synchronous engagement across all participant families

Table 1

Vineland-II age equivalence scores for all participant children

Vineland-II domain	Child 1 Age 4:3	Child 2 Age 2:4	Child 3 Age 2:11
Socialization			
Interpersonal	1:4	0:9	1:1
Play/leisure time	0:9	0:9	1:2
Coping	1:11	0:4	0:4
Communication			
Receptive	1:6	0:6	1:3
Expressive	2:0	1:4	1:3
Motor			
Gross	2:5	1:8	3:1
Fine	2:5	1:11	2:5
Daily living skills			
Personal	2:0	1:6	2:0
Domestic	1:6	0:10	0:7
Community	0:3	0:7	2:6

Table 2

Examples of non-social and embedded social consequences in PRT language opportunities

Activity and child behavior	Non-social consequence	Embedded social consequence
Bouncing on a Trampoline Child says "jump"	Child is given the opportunity to jump on the trampoline	Parent jumps with the child
Listening to a preferred song on TV Child requests "music"	Parent starts the video and allows the child to hear the preferred song	Parent sings the preferred song to the child
Playing on a preferred swing Child requests "swing"	Child is given the opportunity to play on the swing	Parent pushes the child on the swing
Playing in the bathtub Child requests "splash"	Child is given the opportunity to splash around	Parent splashes with the child
Playing with a blanket Child requests "blanket"	Child is given a preferred blanket to wrap around themselves	Parent wraps the blanket around the child

Adapted from Koegel et al. (2009); used with permission