The Effects of A Parent-Mediated Social-Communication Intervention on Joint Attention Outcomes in Young Children with Autism

Introduction and Purpose

Recent evidence suggests that human social-communicative behaviors emerge from early non-verbal interactions between early learners and their primary caregivers (Mundy & Newell, 2007; Schertz, Odom, Baggett, & Sideris, 2013). These interactions take place in the context of joint attention (JA), defined as “coordinating attention to an event or object with another individual, sharing interest and social engagement, and showing an understanding that the partner is sharing the same focus” (Schertz & Odom, 2004). Children with ASD show early deficits in their ability to engage in and sustain joint attention. This reduced ability to initiate, respond, and maintain joint attention restricts social learning over the first years of life, resulting in cascading deficits across developmental domains. As such, joint attention has been deemed a “cardinal deficit” of individuals on the spectrum of autism (Mundy & Crowson, 1997)

Since parents are a child’s first communicative partners, they are in the unique position of being able to deliver treatment strategies that support early interactions throughout daily routines, thus magnifying the intensity of treatments that target social communication and joint attention. Indeed, a significant number of authors have demonstrated positive effects on social-communication outcomes using parent-mediated interventions that target early interactions (Kasari et al., 2010; Schertz et al., 2013; Sullivan et al., 2007; Vismara & Lyons, 2007). Despite this, it is not yet clear that parent-mediated social-communication interventions are consistently effective, and more work is needed to identify the “active ingredients” of parent-mediated interventions designed for young children with ASD (Wallace & Rogers, 2010).

The proposed study involves teaching parents or other primary caregivers to use the interactive techniques described by Ingersoll and Dvortcsak in Teaching Social Communication to Children with Autism (2010), a social-communication approach that uses a combination of evidence-based practices drawn from naturalistic applied behavioral analysis (ABA) approaches and developmental theory. These techniques, which have demonstrated effectiveness in a variety of forms (Kasari et al., 2010; Prelock, Calhoun, Morris, & Platt, 2011; Schertz & Odom, 2007), teach parents to create opportunities for child initiations, maximize engagement, and increase parent responsiveness. Given that techniques such as these may improve social-communication outcomes because they enhance JA functioning, and that primary caregivers are an essential element of emerging joint attention, the research questions of the current study are as follows: 1) to what extent do parent-mediated interactive techniques affect JA outcomes? 2) can parents learn these interactive techniques with fidelity? 3) Is parent intervention fidelity associated with differential child JA outcomes when using this type of intervention?

Method

Participants: Three to five children under the age of 5 years with a diagnosis of ASD and a primary caregiver will be recruited through local school districts or agencies. Children may be engaged in other early intervention services, but those children who have already participated in
a home-based social-communication treatment will be excluded. Caregivers must be interested in a weekly home-based intervention, and consent to video recording.

**Experimental Design and Procedures:** A multiple-baseline design across participants will be employed. All participants will begin in baseline at the same time. The first dyad attaining baseline criterion of 3-5 data points reflecting steady state baseline responding will begin the first intervention topic, as the others are held in baseline. When the first child reaches steady state responding ≥ 3-5 data points during the first topic, that dyad will begin the next topic, and the second dyad may begin the first intervention topic. The third dyad will enter intervention from baseline after the second dyad reaches criterion within the first topic, and so on. Phase transition decisions will be based on child JA outcomes exclusively, as parent fidelity data will be analyzed retrospectively in association with child JA outcomes.

**Baseline:** Baseline will be conducted in the area of the home where the parent has indicated that they play together most often, using toys selected by the parent. The parent will be instructed to play with the child in the same manner as she or he normally would, with no coaching/feedback.

**Intervention:** Each home session will begin with a 10 min parent-child play sample in which the parent will be asked to play with the child using the cumulative strategies learned to date. The sessions will be conducted in an area of the home chosen by the parent using toys selected by the parent. Parents will not receive coaching or feedback during the play sample. A didactic lesson will follow. The intervention will focus on 8 lessons from *Teaching Social Communication to Young Children with Autism* (Ingersoll & Dvortcsak, 2010): 1) Overview 2) Set Up Home For Success 3) Follow Child’s Lead 4) Imitate Child /Animation 5) Modeling / Expanding Language 6) Turn Taking 7) Modeling/Expanding Play 8) Communicative Temptations.

**Follow-up:** Three follow-up play samples will be conducted 2 weeks after the final didactic session to assess maintenance and generalization. The play samples will follow the same procedures as the baseline, using toys selected by the parent.

**Dependent Measures**

For each dyad, data will be gathered from three videotaped 10-minute play samples each week: the 10 min play sample before the didactic session as described above, and two similar sessions recorded on two of the remaining days of the same week. Each of these play samples will be recorded in the play area where the didactic sessions typically occurred, with instructions to play with the child using the techniques learned during previous didactic sessions, in the absence of coaching or feedback.

All data will be coded from videotape between didactic sessions, using duration to record joint engagement states (JE), a frequency count to record initiating joint attention (IJA) behaviors, and a ratio of responding to joint attention (RJA) behaviors per parent initiation for the RJA measure. Coding definitions are as follows:

1. **Joint Engagement (JE) States:** An engagement state is defined as a period of at least 3 s that is characterized by the child’s active interest in people and in objects and events (Adamson, Bakeman, Deckner, & Nelson, 2012). Joint engagement states reflect various levels of episodes of mutual engagement with a communicative partner, rather than discrete behaviors. These periods “set the stage” for discrete JA behaviors (IJA, RJA), and describe the circumstances
under which JA emerges and is sustained. The stated definitions are based on those used in The Communication Play Protocol (Adamson, Bakeman, & Deckner, 2004, see table below). 2. Joint Attention Behaviors: Initiating and Responding: Initiating joint attention (IJA) are discrete behaviors in which the child directs the attention of the caregiver. Responding to joint attention (RJA) are discrete behaviors in which the child reciprocates a bid for attention by the caregiver. Coding definitions are described below. IJA is measured as frequency per 10 minute play sample and RJA as the ratio of episodes of RJA to total caregiver initiations per 10-minute play sample.

**Joint Engagement (JE)**

1. **Unengaged (UE):** The child is uninvolved with any specific person, people, objects or activity although he or she may be looking around the room.

2. **Onlooking (O):** The child is watching the caregiver’s activity but is not taking part in that activity.

3. **Person Engaged (PE):** The child is involved solely with the caregiver as a social partner.

4. **Object Engaged (OE):** The child is actively involved with playing with objects alone, attending just to the objects at hand.

5. **Supported Joint Engaged (SJE):** The child and caregiver are actively involved in the same object, person, or event of interest but the child does not acknowledge the caregiver.

6. **Coordinated Joint Engaged (CJE):** The child and caregiver are actively involved in the same object, shared focus, and the child repeatedly acknowledges the parent throughout the interaction by way of sustained visual regard.

**Initiating Joint Attention (IJA)**

1. **Looking to caregiver’s face for at least 1 s while moving, touching, or manipulating object (EC)**

2. **Alternating eye gaze between and object, person, or event and the caregiver who is sharing attention with the same visual focus. (AG)**

3. **Using a distal point to an object, person, or event in the environment [with or without eye contact] (DPOINT)**

4. **Showing an object (with or without eye contact) (SHOW)**

5. **Using a proximal point to object, person, or toy + eye contact. (In the current study, proximal pointing to pictures while sharing a book does not require eye contact) (PPOINT)**

6. **Using non-word vocalization + eye contact when engaged with the same point of interest with caregiver (VOC)**

7. **Using word to comment on object or event of shared focus (COMMENT)**

8. **Using positive affect/smiling + eye contact when engaged with the same point of interest with caregiver (PAJA)**

**Responding Joint Attention (RJA)**

1. **When the participating caregiver uses any kind of communicative bid, including verbal directive, comment, and/or point with the intention of having the child turn his head/eye gaze to engage in joint attention with the shared visual focus.**

2. **Child and caregiver must be engaged in separate objects/events of focus before the caregiver initiation for RJA.**

(Adamson et al., 2004)

3. **Primary Caregiver Intervention Fidelity Scores:** Caregiver fidelity scores will be measured using the form developed by Ingersoll and Dvortcsak (2010) and modified to include only the 15 items focused on interactive techniques. This form uses a 1-5 Likert scale format with 1 = does not implement techniques half the time but misses many opportunities, and 5 = implements throughout the session. Fidelity per session will be summarized as a single score across items. The student researcher and a second coder will separately view videotape of the play samples to score weekly parent fidelity measures.

**Reliability and Validity:** The student researcher will be the primary coder and will train a graduate student to be a reliability coder. The reliability coder will be trained using samples of non-study videotape and relevant data recording sheets, including the parent intervention fidelity form. Training will take place until the student researcher and the second coder have reached an agreement level of 85% during practice sessions. Videotapes will be randomly selected and inter-
Rater agreement will be conducted for 25% of the sessions across participants and study conditions. Social validity will be measured using the Ingersoll and Dvortcsak (2010) Parent Satisfaction Survey, which uses 12 items to determine level of satisfaction with the intervention and with the child’s outcomes.

**Data Analysis:** To determine the effect of the parent-implemented intervention on JA outcomes, data for individual JA (IJA, RJA) outcomes will be plotted graphically for analysis within-participant across time/sessions, and graphs of the participants will be arranged to be visually concurrent across baselines and intervention phases. Similarly, JE states will be displayed graphically as a percentage of time spent in each mutually exclusive state across time/phases. Graphs will be analyzed visually for trend and level. To determine the level of parent fidelity in the implementation of the strategies, data points will be plotted per session and visually analyzed by trend and level. To determine the relationship between parent fidelity and child outcomes, parent fidelity will be plotted and visually analyzed in the context of the associated child’s JE and JA data points over the same time frame.

**Personnel:** The student researcher will be the primary interventionist, trainer, and coder in this study. A second graduate student will be hired to videotape all study sessions. A third graduate student unrelated to the current study will be hired as a second coder for JA outcomes and for parent fidelity scoring. The student researcher’s advisor will oversee the execution of the study and serve as the primary advisor.

**Anticipated Results:** Based on previous research, it is anticipated that the interactive techniques in question will improve both joint engagement and joint attention behaviors (RJA and IJA). Similarly, it is likely that increased levels of parent implementation fidelity will be associated with higher-level JE, IJA and RJA outcomes.

**Importance of Study:** Physicians and other community professionals are now identifying children with ASD in the first two years of life. Given that joint attention evolves from the earliest interactions with parents and other primary caregivers, and is a foundational capacity from which more complex social-communication behaviors emerge, it is critical to identify feasible strategies such as these that may directly impact early joint attention states and behaviors. Furthermore, by examining how parents learn and implement new intervention techniques with fidelity, and how fidelity then impacts child outcomes, early intervention professionals may be better equipped to deliver meaningful and timely interventions where and when they are needed the most. We anticipate that the study will be presented at the Annual Conference of the Division for Early Childhood Conference of the Council for Exceptional Children. In addition, the study will be prepared as a manuscript and submitted to the *Journal of Early Intervention*. The study also serves as a pilot exploration for defining the subject area for the doctoral dissertation of the student researcher.
Budget Proposed for Research Project:

1. $120 stipend per family x 5 families = $600
2. Video camera (Sony HDR-AS304) = $250
3. Stipend for graduate student video recorder
   @ $10 an hour: 2.5 hours per visit including travel
   = 2.5 x 10 visits per family x 5 families = $1250
4. Stipend for graduate student/ second coder
   @$15 an hour x 5 hours/ x 10 weeks
   + 10 hours of training on coding procedure = $900

**Total Expenses Requested:** = $3000

Rationale for proposed budget:

1. A participant payment for the family is offered to thank them for the time and effort put forth on behalf of the study. This will be a reimbursement for the time spent meeting not only for the intervention but the two other meetings during the week, during which a generalization play sample will be collected. Offering reimbursement reflects the value of their time and encourages consistent participation in the project.
2. A video camera will be necessary for recording the sessions for the purpose of subsequently coding child and parent behaviors relevant to the study. This camera will remain available to the department for other projects such as these throughout the year. The Sony HDR-AS304 is a wide-lens action video camera that will enable a clear shot of the child and his or her parent as the child moves about the room.
3. A second person will be needed to record sessions so that the primary student researcher can conduct the intervention unheeded by the necessity to attend to the videotaping. This type of data collection must capture full facial expressions and head turns, as well as eye contact/eye gaze direction. An additional person will be able to move with the child as she or he plays in order to accomplish this.
4. The second coder will be coding 25% of the video samples. There will be 30 minutes of play samples a week for roughly 10 weeks, including baseline and follow up samples, depending on how participants move through the phases. It is estimated that a coder will spend between 1.5 to 2 hours coding each 10 minute play sample, thus 5 hours weekly was calculated for this purpose. In addition, the coder will require 10 hours of coaching throughout the study to gain and maintain mastery of a fairly extensive coding scheme.


