Symposium Title: A Continuum of Technology Use in Parent Mediated Interventions

Chair: Lauren Little

Discussant: Brian Boyd

Overview: Parent mediated intervention models are used to target various adaptive behavior skills among children with developmental conditions (for review see Nevill, Lecavalier, & Stratis, 2018). Given the increase in availability of technology, parent mediated interventions have incorporated diverse methods of technology use (e.g., Parson, Cordier, Vaz, & Less, 2017). In this symposium, we present a continuum of technology use across parent mediated interventions with an emphasis on how technology may support parent self-efficacy through an intervention. The first presentation describes an evaluation of a parent mediated mealtime behavior intervention for young children with autism; this presentation focuses on how parents reported that more involvement of technology would be effective in increasing a sense of self-efficacy in delivering the intervention strategies. The second presentation focuses on how technology may be used as a vital component of a parent-mediated intervention; the Parents and Infants Engaged (PIE) project used video review feedback to facilitate parents’ sense of efficacy in using intervention strategies. The third presentation serves as another example of technology embedded within an intervention; the researchers show how parents are using speech generating devices (SGD) for young children with Fragile X Syndrome. In the fourth presentation, we move across the continuum of technology use to show how a parent mediated intervention may be delivered solely over telehealth (i.e., videoconferencing). The fifth presentation demonstrates how technology can be used to both deliver a parent-mediated intervention via telehealth as well as how parent self-efficacy outcomes may be continuously evaluated using ecological momentary assessment gathered via text messaging. The presentations in this proposed symposium are diverse; however, we have positioned each to show how technology may be used across a continuum from the least intrusive to the most vital method of intervention and evaluation.

References/citations


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Paper 1 of 4

Paper Title: Effectiveness of a Pilot Parent-Mediated Intervention to Address Feeding Challenges for Children with Autism and Intervention Adaptations Based on Parent Stakeholders Feedback

Authors: Brittany St. John, MS, OTR/L & Karla Ausderau, PhD, OTR/L

Introduction: Feeding challenges in children with autism can significantly impact the development of positive family mealtime interactions (Curtin et al., 2015; Thullen & Bonsall, 2017). Parent-mediated interventions have been shown to be successful at addressing a variety of functional skills with children with ASD while intervening in an ecologically valid family context (Althoff,
Dammann, Hope, & Ausderau, 2019). The purpose of this pilot study was to assess the feasibility and effectiveness of an in-home parent-mediated feeding intervention for families with children with autism at achieving child and family mealtime goals.

**Methods:** Seventeen children diagnosed with ASD (ages 2-7 years) with parent reported feeding problems participated in a 6-month pilot in-home parent-mediated feeding intervention (combination of parent-training, direct intervention, and parent coaching). Goal Attainment Scaling (GAS) was used to measure progress on child and family goals. GAS T-scores were calculated to assess intervention effectiveness. Exit interviews were collected from all parents to identify family-centered intervention modifications to integrate into the next phase of the intervention study.

**Results:** Participants who completed the parent-mediated in-home feeding intervention had an average GAS T-score of 61.80 (SD = 10.85). GAS T-scores ranged from 45.59 to 76.44. Twelve of the 17 participants had intervention outcomes at or above expectations (50-76.44) with seven more than one standard deviation above the mean. Two participants had GAS T-scores below 50, indicating intervention outcomes lower than expected. The Participants’ mean T-score was significantly higher than the accepted mean of population GAS T-scores (50; Kiresuk & Sherman, 1968), t(13) = 4.07, p = .001. During exit interviews, families identified that the intervention would be improved by providing access to parent training information through different modalities including online modules and gentle reminders, such as a short text message. Parents reported that the use technology to review material would support their use of strategies and address goals.

**Discussion:** These findings provide preliminary support for the use of in-home parent-mediated interventions for improving eating skills and mealtime behaviors in children with autism. Parent feedback will be integrated into the intervention design for future applications. Parent training materials will be available in a digital format, and regular text message reminders will be included. In addition, parents of children with autism experience an increased level of parenting stress and report further increased stress during mealtime (Curtin et al., 2015). The use of physiological stress measures including hair cortisol sampling and dyadic wireless heart rate variability measurement on both the parent and child simultaneously will be used to assess changes in physiological stress experiences of parents and children during mealtime activities pre-, midpoint, and post-intervention. The data will provide an objective measure to assess how stress may be influencing both parent and child behavior during mealtime and intervention activities.

**References/Citations**


Introduction: With the advent of affordable video technology (e.g., iPads), video feedback or review is becoming a more commonly used technique during behavioral interventions targeting parent-child interaction, with potential for scalability. This technique is often used in the context of behavioral interventions to draw attention to positive behaviors, to reinforce emerging skills, as well as to address areas that could benefit from enhancement during parent-child interactions. Studies show that such strategies may improve parenting behaviors, parental attitudes, and child behavior in clinical populations, including Autism Spectrum Disorder (ASD) (Fukkink, 2008); however, there is limited knowledge of the utility of video review and feedback in interventions targeting increased dyadic engagement for parents and infants who are at-risk for ASD (Green et al., 2015). Thus, the purpose of this study is to investigate the utility of video review and feedback within a novel intervention, Parents and Infants Engaged (PIE), an NIH funded randomized clinical trial (RCT) comparing a sensory-regulatory functions and intentional communication intervention using a reflective parent-coaching model for families with infants ages 11-16 months. Video review and feedback, using low-cost iPad technology, is a critical component used to support reflective coaching with the parent.

Methods: This analysis of extant data from the RCT study (above) uses a mixed-methods approach to understanding the utility of the video review process. Intervention coaches videotape parent-infant interactions each week in the course of daily routines (i.e., play time, meal time, grooming). Typically, videos are recorded on the iPad by the intervention coach near the end of the session after parents have practiced a strategy they will attempt to integrate into daily routines before the next session. Intervention coaches later select a minimum of four dyadic interactions to discuss with parents the following week in order to facilitate awareness of child behaviors and parental responsive strategies to build dyadic engagement across the 12-week intervention. Three sources of data will be triangulated for more in-depth understanding of experiences, facilitators, challenges, and fidelity of administration: 1) Structured qualitative interviews with intervention coaches; 2) Structured qualitative interviews with parent participants; and 3) Quantitative fidelity ratings of videotaped intervention sessions using the video review and feedback strategies. The target sample for analyses includes 6 intervention coaches and 40 parents. Interviews and notes will be coded and summarized for descriptive themes. Fidelity to intervention will be scored for ~30% (n = 160) of recorded sessions by two independent research assistants, based on (1) a checklist (yes/no) of all items for each section of the intervention sessions (Introduction, Video Review, Live Coaching, Family Planning), as well as (2) a quality rating [1 = poor; qualities indicators are never or seldom apparent to 5 = excellent; all quality indicators are apparent and consistent throughout the session] based on specific indicators, such as using reflective questioning, demonstrating active listening, and sharing informative feedback relevant to a specific domain.

Results: Preliminary results from 10 quantitatively coded video sessions, and qualitative data from 3 coaches, and 8 parents are summarized here; results of the fuller data set (as noted in methods) will be available for the presentation.

Experiences/Facilitators: A majority of parents reported that video review was a useful part of the intervention and helped to identify behaviors (theirs or the child’s) that they would not typically notice. Coaches similarly reported that video review helped parents to see concrete sensory regulatory or communicative behaviors of the child and the parent (e.g., hypo-reactivity of the child when the parent activates a musical toy or the child looking back and forth between a toy and the parent), as well as...
responsive strategies of the parent (e.g., responsive strategy they used following a child communication lead or hyper-reactive response). Coaches were able to draw upon video review discussions to facilitate live coaching. **Challenges:** Coaches conveyed challenges including difficulties with the video review process with the parents in the presence of their infants (e.g., infant had extreme interest in the iPad; need to keep the infant safe and entertained, which disrupts the video review process). Additionally, coaches felt that a parent’s performance during video recording may be impacted initially by the presence of the coach, but this problem was short-lived (e.g., first 2 of 12 sessions provided). **Fidelity:** Fidelity scoring revealed that the coaches completed more items successfully for the video review section (m = 89%) than they did for other sections of the intervention (m = 46-77%). The mean rating for the quality indicator was also higher for the video review portion (m = 3.1) than for the other intervention sections (m = 1.9 – 2.8).

**Discussion:** Taken together, qualitative and quantitative data findings suggest that video review and feedback as a component of the PIE parent-infant coaching intervention has considerable utility, adding value for both coaches and parents. However, the process of video review can pose difficulties to coaches and parents when working with young infants, which needs to be addressed in future studies. Additionally, fidelity of administration of the video review component of the intervention was high, and appeared less challenging for interventionists to master than other intervention components addressed in the PIE study.

**References/citations**


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**Paper 3 of 5**

**Paper Title:** Effects of Caregiver-Responsivity training on Caregiver Use of Speech-Generating Devices During Play-Based Interactions with Young Children with Fragile X Syndrome.

**Authors:** Anne Hoffmann¹ and Andrea McDuffie²

**Introduction:** Fragile X Syndrome (FXS) is a developmental disorder resulting from a mutation in the FMRI gene on the X chromosome. FXS is the most common inherited cause of intellectual disability (Coffee, 2009). Both males and females with FXS frequently have delayed language development, with many of them remaining minimally verbal far longer than their typically developing peers (Brady et al., 2006). This delay in language acquisition sometimes results in the use of Augmentative Alternative Communication (AAC) including speech-generating devices (SGD). Research has indicated that caregivers sometimes have difficulty integrating AAC into interactions with their children, limiting generalizability of these communication systems (Johnson et al., 2006; Parette & Angelo, 1996). This study examines the effects of a general caregiver responsivity training protocol on caregiver use of SGD while interacting with young children with FXS.

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¹Rush University  
²University of California Davis MIND Institute

**Methods:** Participants were families already enrolled in a clinical trial examining the effects of a novel pharmaceutical agent paired with caregiver responsivity training. Inclusionary criteria for the children were a diagnosis of FXS, age between 33 months and 6 years, English as the primary language in the home, and the use of at least 3 intentional communication acts by the child during a 25 minute communication sample. Caregivers were enrolled in an intensive language intervention protocol for four
months that involved monthly caregiver education sessions, weekly Skype coaching sessions (a speech-language pathologist would provide real-time suggestions via Bluetooth), weekly homework sessions (caregivers recorded themselves implementing intervention techniques while interacting with their child), and weekly feedback sessions (SLPs provided feedback to caregiver based on homework sessions). After four months, caregivers transitioned to monthly coaching, homework, and feedback sessions. Four families enrolled in this study were identified as using a SGD. Homework sessions were analyzed to limit the effect of immediate coaching on use of strategies in order to gain a better understanding of how caregivers were generalizing techniques. The first homework session of each month during the intensive portion and the single monthly homework sessions will be rated using the Responsive Alternative and Augmentative Communicative Style scale—Third Edition (RAACS-3; Broberg, Ferm, & Thunberg, 2012) which codes each minute of a ten minute interaction period for caregiver behaviors such as caregiver clarification of their own communication, caregiver expansion of child communication, and caregiver use of SGD. These behaviors are scored on a scale of 0 (absent) to two (often present). In addition to this, two behaviors were also scored for the incorporation of SGD: 1) The caregiver supplements his or her own communication and 2) The caregiver expands on the child’s communication.

**Results:** An initial analysis of a limited number of sessions (one family, 4 homework sessions) was performed. Mean scores for observations of 1) Caregiver clarification of their own communication, 2) Caregiver expansion of child communication and 3) Caregiver use of SGD are shown in Figure 1. These data show a trend for caregivers to more consistently clarify their own communication (i.e., repeat their own utterances, use simple language, etc.) than to either expand their child’s utterances or use SGD.

![Graph showing mean scores for observations](image)

Both observations (1) and (2) were also coded for whether the caregiver used SGD to supplement their own communication or expand their child’s communication. These results are shown in Table 1, and reflect a tendency for the caregiver to use SGD more frequently to clarify their own communication than to expand the child’s communication.

<table>
<thead>
<tr>
<th>Homework Session</th>
<th>Number of intervals with caregiver SGD use</th>
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<tr>
<td></td>
<td>Caregiver Clarification</td>
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<tr>
<td>1</td>
<td>8/10</td>
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<tr>
<td>2</td>
<td>4/10</td>
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Discussion: These pilot data show a tendency for caregivers to show greater consistency in clarification of their own communication as opposed to expansion of their child’s communication or use of SGD. This may reflect the difficulty in caregiver’s interpreting their nonverbal child’s communication and then using SGD to expand upon it. This may also explain the tendency for this caregiver to use SGD more frequently to supplement their own communication instead of expanding their child’s communication. Final data analysis will include several more participants, as well as more homework sessions for this particular family. This will allow for more conclusions to be drawn regarding caregiver use of SGD during interactions with their child.

References/citations


Paper Title: Tele-SCOPE: A Telehealth Delivered Adaptive Behavior Intervention for Children with Autism

Authors: Lauren M. Little¹, Anna Wallisch², & Winnie Dunn³

Introduction: Children with autism spectrum disorders (ASD) experience adaptive behavior difficulties that persist throughout their lives (Billstedt et al., 2007). For young children with ASD, adaptive behavior difficulties contribute to parent stress (Hall & Graff, 2011) and may decrease effectiveness of interventions designed to target core features of ____________

¹Rush University
²University of Kansas, Juniper Gardens Children’s Project
³University of Missouri

the disorder. While parent-mediated interventions are efficacious in promoting long-term positive outcomes among children with ASD, there is a lack of approaches that directly teach parents to target discrete and specific adaptive behaviors. Additionally, the number of ASD diagnoses is rapidly increasing while available resources to provide intervention services are decreasing (Boyd et al., 2010). Due to this shortage, alternate service delivery models such as telehealth and self-directed technology-based applications have emerged as evidence-based methods to provide intervention services. Tele-SCOPE (Telehealth Strategies for Collaborative Occupational Performance Engagement) is a parent coaching intervention that combines self-directed online educational modules with live video visits with an occupational therapist to increase child adaptive behavior, including toilet training. In this study, we investigated the acceptability and preliminary efficacy of a 10 session telehealth toilet training intervention on children’s toileting behavior, parents’ satisfaction with children’s toileting behavior, and parent sense of self-efficacy.

Methods: This study used a quasi-experimental, pretest posttest design. We enrolled n=34 caregivers of children with ASD ages 2-8 years old (mean=65.80 mos., SD=20.80 mos., range 32-72 mos.). We met with families for 10 sessions over 10-14 weeks,
which included 5 live video visits and 5 email exchanges. Caregivers also had access to our website, which consists of 9 podcasts and tip sheets about specific elements of toilet training (e.g., sensory processing, motor skills). We assessed acceptability using the Telehealth Acceptability Questionnaire (adapted from Vismara et al., 2012) and child/parent changes using the Toileting Behavior Questionnaire (Little et al., under review), the Canadian Occupational Performance Measure (Law et al., 1992), and Parenting Sense of Competence Scale (Johnston & Mash, 1999). We used descriptive statistics to understand parent ratings of acceptability and paired sample t-tests to examine changes in children’s toileting behavior, parents’ satisfaction with children’s toileting behavior, and parent sense of self-efficacy.

Results: Twenty-five caregivers completed all intervention procedures and n=9 reported that they could no longer participate for various reasons (e.g., child diagnosed with GI condition, family moved). Children that did not complete the intervention versus those that did were not significantly different on autism severity (as measured by the Social Responsiveness Scale [Constantino & Gruber, 2012]; t=.224[29], p=.809) or chronological age (t=.503[29], p=.619). Acceptability scale results (on a 1 [strongly agree] to 6 [strongly disagree] scale) showed that parents that completed the intervention found the procedures highly acceptable (mean=1.48, SD=.73, range 1-4.50). Children showed significant gains in toilet training behavior (t=3.231[24], p<.01) and parent satisfaction with children’s toileting behavior (t= -5.475[20], p>.001). Parenting sense of self-efficacy did not significantly change.

Discussion: When children with ASD are independent in toileting, they have more opportunities for participation and engagement in activities to target core features of the disorder (Cicero & Pfadt, 2002; Richardson, 2016). The findings of the current study show that a short-term, parent coaching intervention delivered via telehealth may be an effective method to target toilet training skills in children with ASD. While we are limited by the rates of attrition in this study, our results suggest that telehealth may be an innovative service delivery method to address this critical adaptive behavior in young children.

References/citations


Paper 5 of 5

Paper Title: How Do We Measure Outcomes Via Telehealth? The Feasibility of Ecological Momentary Assessment During a Telehealth Intervention for Families of Children with ASD

Authors: Anna Wallisch¹, Lauren M. Little², & Winnie Dunn³

Introduction: Families of young children with autism spectrum disorders (ASD) often face barriers in accessing intervention services (Boyd, Odom, Humphreys, & Sam, 2010). Telehealth has the potential to reduce various accessibility issues (e.g., provider shortages), and preliminary research suggests coaching via telehealth, a family-centered intervention, generates improved outcomes for child participation and parent self-efficacy. However, research is needed on how to measure outcomes of coaching interventions delivered via telehealth. Ecological momentary assessment (EMA) is a method used to collect real time information and across natural contexts (Shiffman, Stone, & Hufford, 2008). Given the measurement challenges associated with telehealth delivered interventions (i.e., never seeing the families ‘in-person’), EMA may help measure changes in parent factors that occur in real time and offer complementary approaches to current ways of measuring outcomes in telehealth interventions.
Therefore, this study examined the feasibility of using EMA to measure parental self-efficacy and stress over a 9 session telehealth coaching intervention.

Methods: This study used a quasi-experimental, pretest-post-test design with n=9 families (n=7 of these families completed the 9-week intervention). Our team met with participants over 9 sessions, which occurred across 9-12 weeks; each coaching session lasted approximately 60 minutes. Once a week at a random time, participants were sent a link to a survey (via email or text), with one reminder email sent 24 hours later. Surveys consisted of questions from 3 domains: self-efficacy, parental stress, and general stress. To evaluate the feasibility of using EMA, we calculated the percentage of response rates for each survey attempt and the amount of time it took for parents to complete the survey. We used exact Wilcoxon Signed Rank Tests to test pre to post intervention differences in EMA scores in 1) parental self-efficacy; 2) parenting stress; and 3) general stress.

Results: Overall, participants completed 78.57% of EMA data collection. Without a follow up reminder, parents completed the link within a mean time of 5 hours, 10 minutes, 2 seconds. We sent 12 follow up reminders to parents who did not respond within 24 hours, with 3/12 reminders receiving responses. The mean survey completion time after receiving a reminder was 2 hours 23 minutes 45 seconds. Results of the EMA data collection, while preliminary, showed a non-significant increase in parent self-efficacy (Wilcoxon Z= -1.761, p=.078, Cohen’s d=0.56); a significant decrease in parental stress (Wilcoxon Z= 2.070, p<.05, Cohen’s d=0.65); and a non-significant decrease in generalized stress (Wilcoxon Z=-0.677, p=.498, Cohen’s d=.21).

Discussion: Novel findings from the current study suggest that EMA may be a feasible method to gather data on the outcomes of a short-term telehealth intervention for families of young children with ASD. Overall, findings showed that parents responded to the majority of EMA bids by text messaging or email. EMA findings showed that parents experienced a decrease in parenting stress (e.g., stress directly related to child’s behavior) but not generalized stress (e.g., difficulty coping with responsibilities). More research is needed to understand how coaching may impact parenting stress for families of children with ASD over time.

References/citations:

