

Effects of a Caregiver-Implemented Intervention on the Motor and Communication
Outcomes of Infants and Toddlers with Significant Disabilities

By

Kelly S. Windsor

Dissertation

Submitted to the Faculty of the
Graduate School of Vanderbilt University
in partial fulfillment of the requirements

for the degree of

DOCTOR OF PHILOSOPHY

in

Special Education

May, 2016

Nashville, Tennessee

Approved:

Ann P. Kaiser, Ph.D.

Mary Louise Hemmeter, Ph.D.

Stephen M. Camarata, Ph.D.

Juliann J. Woods, Ph.D.

ACKNOWLEDGEMENTS

This dissertation is dedicated to my mom, Sylvia Windsor. While I wish that you were here to share this with me in person, I know that you are always with me, and thinking “It’s about time!”

I owe thanks to so many, and “thank you” seems so small in comparison to the gifts you have given me. Thank you first to my mentor, Ann Kaiser. From the day we met, you have inspired me with your love of children and families and your passion for giving them the best you-and your students and staff-have to give. You have taught me much about research and life, and this would not have been possible without your boundless support and expert guidance. To Juliann Woods, thank you for the opportunity to learn from you and share in your work, for treating me like one of your own, and for your guidance throughout this study. Thanks also to my committee members, Drs. Mary Louise Hemmeter and Stephen Camarata. Thank you for your thoughtful contributions, and your encouragement to dig deeper. I have learned from each of you.

Thank you to the investigators on the Embedded Practices and Instruction with Caregivers project, Drs. Christine Salisbury, Patricia Snyder, and Juliann Woods, for the opportunity to participate in this project, from which I learned so much. Thank you to the undergraduate and graduate assistants who participated in gathering and coding the data, without whom none of this would be possible!

Many thanks to the friends and colleagues at the KidTalk research projects at Vanderbilt University with whom I worked over the years. We shared many experiences, and I learned from each of you.

Finally, thank you to many children and families with whom I have worked over the years and to the participants in this study. I am grateful every day for the opportunity to know all of you, and you each hold a place in my heart. I have received far more than I have given!

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	ii
LIST OF TABLES	vi
LIST OF FIGURES	vii
Introduction.....	1
Methods.....	9
Participants.....	9
Settings and Materials.....	10
Design	11
Measures	12
Assessments	12
Observational Measures.....	13
Caregiver Reports	15
Procedural Fidelity.....	15
Interobserver Agreement	16
Procedures.....	16
Results.....	18
Correct Learning Trials, Number of Strategies, and Child Target Use by Session.....	19
Correct Learning Trials, Number of Strategies, and Child Target Use for Each Target in Each Routine	20
Generalization	24
Social Validity	26
Discussion.....	26
Limitations	29
Implications.....	30
Conclusions.....	31
Appendix	
A. EPIC Visual Model	57
B. Correct Learning Trial Coding Sheet.....	59

C. “How” Strategies.....	60
D. Caregiver Diary.....	62
E. Caregiver Feedback Survey.....	63
F. SOOPR Coaching Observable Practices	65
G. Identifying Family Routines and Activities and Summary Routine and Target Information	68
REFERENCES	33

LIST OF TABLES

Table	Page
1. EMT Strategies Applied Across both Communication and Motor Domains	41
2. Participant Demographic Characteristics.....	42
3. Participants’ Use of Community Services	42
4. Child Abilities at Baseline	43
5. Example Trials Using Enhanced Milieu Teaching Strategies	44
6. Child Communication and Motor Targets	45
7. Caregiver Identified Routines and Example Strategies for Each Dyad.....	46
8. Means and Ranges of Caregiver CLT Rate per Minute and Number of Strategies, and Rate of Total and Spontaneous Child Target Use in Sessions	47
9. Means and Ranges of Caregiver CLT Rate per Minute and Number of Strategies for Communication and Motor Targets During Play and Caregiving Routines in Sessions.....	48
10. Means and Ranges of Child Total and Spontaneous Communication and Motor Targets During Play and Caregiving Routines in Sessions	49
11. Means and Ranges of Caregiver CLT Rate per Minute and Number of Strategies, and Rate of Total and Spontaneous Child Target Use in Caregiver Probes.....	50
12. Means and Ranges of Caregiver CLT Rate per Minute and Number of Strategies for Communication and Motor Targets during Play and Caregiving Routines in Caregiver Probes.....	50
13. Means and Ranges of Child Total and Spontaneous Communication and Motor Targets during Play and Caregiving Routines in Caregiver Probes	51

LIST OF FIGURES

Figure	Page
1. Multiple Probe Design Across Dyads.....	53
2. Dyad 1’s Caregiver rate per minute of CLT and number of strategies and child rate per minute of total and spontaneous targets for communication and motor targets in play and caregiving routines.....	54
3. Dyad 2’s Caregiver rate per minute of CLT and number of strategies and child rate per minute of total and spontaneous targets for communication and motor targets in play and caregiving routines.....	55
4. Dyad 3’s Caregiver rate per minute of CLT and number of strategies and child rate per minute of total and spontaneous targets for communication and motor targets in play and caregiving routines.....	56

Introduction

Children with delays or developmental disabilities and their families can receive early intervention (EI) services through the Program for Infants and Toddlers with Disabilities (Part C of IDEA) from birth through 2 years (IDEA, 2004). The role of EI is twofold: to support child development and to enhance the caregiver's capacity to maximize their child's potential. It is expected that by enhancing caregiver capacity and supporting child development through high quality EI services, children will achieve better long-term outcomes, and the quality of family life will be improved (Hebbeler & Spiker, 2011). Further, it is expected that EI services will include family directed assessment and goals, occur in natural environments, and utilize scientifically based practices (IDEA, 2004).

Of children enrolled in Part C services, approximately 20% have a diagnosed chromosomal or neurobiological condition which has a high probability of resulting in complex medical needs as well as delays in multiple domains of development (Hebbeler et al., 2007). There is an extremely limited evidence base for early interventions for this population. Further, despite recognition that these children are likely to experience delays in multiple areas, most existing intervention research has focused on instructional strategies that address a single developmental domain (e.g., communication or behavior) (Hebbeler & Spiker, 2011). There is a critical need to identify effective practices and program models for improving short-term and long-term outcomes for infants and toddlers with significant disabilities and addressing the multiple and complex needs of these children (Guralnick, 2010; Hebbeler, Spiker, & Kahn, 2012).

Although policy, recommended practices, and research recognize the central role of caregivers in child development (e.g., Division for Early Childhood, 2014; IDEA, 2004), there is

limited research in which parents are the implementers of interventions and the everyday activities and materials of the family are used (e.g., Hebbeler, Spiker, & Kahn, 2012). Studies of current service delivery models demonstrate that home visiting practices that support caregivers in enhancing their children's development are not widely used (Dunst, 2012; Roggman, Boyce, & Innocenti, 2010). Research indicates that most home visits are child-focused and that explicit teaching is rarely used to enhance caregivers' competence and confidence in promoting their children's development (Colyvas, Sawyer, & Campbell, 2010; Dunst, 2012; Salisbury, Cambray-Engstrom, & Woods, 2012).

To enhance their children's developmental outcomes, caregivers need the ability to understand their child's learning objectives, identify opportunities for child participation in every day routines, use teaching strategies flexibly for different learning objectives and across different activities, and recognize when additional support, adaptations or new learning objectives are needed for the child (Center for Excellence in Early Childhood Studies, 2011; Woods, Wilcox, Friedman, & Murch, 2011). In a participatory model of service delivery, the dyad is the focus of intervention. Rather than focusing intervention efforts on the child alone, the early intervention provider engages with the dyad to increase the caregiver's confidence and competence in supporting the child's development. Providers in this model are skilled professionals. They must first be knowledgeable about child development, embedded instruction, and specific evidence-based instructional strategies. Second, they must be able to implement effective strategies for supporting caregivers as adult learners (McWilliam, 2015; Trivett, Dunst, Hamby, & O'Herin, 2009). Finally, with an increasing emphasis on the primary service provider model of early intervention, many providers are expected to provide support to caregivers around more than one developmental domain (Marturana, McComish, Woods, & Crais, 2011).

Cascading Interventions

Caregiver-implemented interventions are based on a cascading effects logic. The goal of the early intervention provider is to teach the caregiver specific instructional strategies to be embedded in daily activities which will, in turn, improve child developmental outcomes. To evaluate such triadic or cascading intervention, it is necessary to define and measure (a) the strategies used to teach the intervention to the caregiver, (b) the caregiver's implementation of these intervention strategies, and (c) the effects of the intervention on the child (Roberts & Kaiser, 2012; Roberts, Kaiser, Wolfe, Bryant, & Spidalieri, 2014). It is important to assess the fidelity of the provider's teaching in order to describe the quantity and quality of intervention received by caregivers, and to determine how much provider teaching is needed for caregivers to implement interventions with fidelity (Roberts & Kaiser, 2011). Continuous monitoring of the provider's teaching strategies as well as caregiver implementation of child intervention strategies can maximize the effects of the intervention, and allow researchers to identify relations between provider fidelity, caregiver fidelity, and child outcomes.

Family Guided Routines Based Intervention

Family Guided Routines Based Intervention (FGRBI) is a coaching intervention approach which incorporates adult learning strategies (Bransford, Brown, & Cocking, 2000; Knowles, Holton, & Swanson, 2011) and family capacity building principles into a collaborative process for building consensus with the caregiver and coaching within the home visit to increase the caregiver's competence and confidence to support their child's learning (Trivette, Dunst, Hamby, & O'Herin, 2009; Woods & Kashinath, 2007). Recent studies indicate that FGRBI is an emerging practice for increasing caregiver capacity and competence for supporting the communication of young children with significant disabilities in multiple routines and that child

use of communication skills increases when participating in the caregiver implemented intervention (Brown & Woods, 2015; Woods, Kashinath, & Goldstein, 2006).

An acronym, SOOPR, guides the provider in the implementation of FGRBI. In Setting the Stage (S), the provider engages the caregiver as the decision maker by gathering updates, connecting current goals to priority outcomes, and building consensus on the routines, targets, and strategies for the visit. In Observation and Opportunities (OO) the provider first observes the caregiver and child interacting during the agreed upon routine without using any specific coaching strategies in order to identify opportunities for child participation, strategies the caregiver already uses, and the child's responses. During Opportunities for Practice, the caregiver interacts with the child during specified routines while the provider uses specific coaching strategies including demonstration with narration, direct teaching, guided practice by the caregiver, general and specific feedback about the caregiver's strategy use, and problem solving (Friedman, Woods, & Salisbury, 2012). During Problem Solving, Planning, and Reflection (P), the provider and caregiver engage in discussion to clarify, revise, or expand caregiver or child actions. Finally, the provider and caregiver jointly Review (R) and plan for what the caregiver and child will do in between sessions.

Enhanced Milieu Teaching

Communication, a critical skill for participating in everyday activities, is often severely delayed in children with significant delays and is frequently a high priority outcome for families (Horn & Kang, 2012). Enhanced Milieu Teaching (EMT) is an established and well-defined naturalistic intervention that has been shown to be effective for improving language and social communication outcomes for preschoolers with developmental delays (Kaiser & Roberts, 2013a, b; Kaiser & Trent, 2007). Research indicates that use of EMT results in increased expressive

communication in young children with language delays (Hancock & Kaiser, 1996; Kaiser & Hampton, in press), children with significant disabilities including Down syndrome (Hemmeter & Kaiser, 1994; Wright, Kaiser, Reikowsky, & Roberts, 2013), and children who are nonverbal (Olive et al., 2007; Kasari, Kaiser, et al. 2014). It has also been demonstrated that caregivers can implement EMT strategies across multiple activities (Hancock, Kaiser, & Delaney, 2002; Roberts et al., 2014; Wright & Kaiser, in press).

EMT is an intervention that strongly emphasizes caregiver responsiveness to the child. There is evidence to suggest that caregiver responsiveness has long-term effects on the language outcomes of children with autism (Siller, Hutman, & Sigman, 2013; Siller & Sigman, 2008) and that maternal responsivity at entry into intervention may predict the effects of intervention for children with other intellectual disabilities (Yoder & Warren, 1998). Given these long-term effects of responsiveness on outcomes, earlier intervention emphasizing caregiver responsiveness may enhance child outcomes and increase potential benefits of later interventions. The key components of EMT include arranging the environment to promote communication, noticing and responding to all child communication, modeling and expanding on child communication, time delay, and prompting (for further description of the intervention, see Kaiser & Roberts, 2013a; Kaiser & Trent, 2007).

A second high need area for infants and toddlers with significant disabilities is motor skills (Horn & Kang, 2012). The ability to engage in self-directed movement impacts one's abilities to participate in daily routines and activities, and to interact with people, objects, and the environment. However, research evidence on effective interventions for motor skills is limited (Horn & Kang, 2012). In an evaluation of one promising intervention, four children between 18 and 39 months of age participated in a single case multiple baseline design across participants

(Horn, Jones, & Warren, 1999). Children participated in three to four 30-minute intervention sessions per week with a trained graduate student. Researchers first identified target motor outcomes for each child, and then identified two skills that contained those component behaviors (e.g., moving from supine to sit to reach for a toy). One skill was taught in intervention, and the second was untreated. Interventions included techniques such as verbal prompts, physical assistance, guidance, and reinforcement. Each child's individualized treatment consisted of six to seven activities designed to facilitate the acquisition of the targeted skill and its components. Each individual activity resulted in a meaningful outcome for the child (e.g., social reinforcement, access to toys, toy activation). All four children increased their use of their target skill as well as the untreated skill (Horn, et al., 1999). This approach shares an important feature with naturalistic interventions such as EMT and incidental teaching in that each learning trial was designed to result in a meaningful outcome for the child. This approach has not been evaluated with caregivers in everyday routines.

In summary, there is a critical need for research on effective strategies to teach caregivers evidence-based interventions, and for research on interventions that support children's development across domains. There is evidence to support the use of specific family-guided coaching strategies associated with FGRBI to teach caregivers how to embed naturalistic intervention strategies to improve children's developmental outcomes (Brown & Woods, 2015; Friedman & Woods, 2015). EMT is an evidence-based naturalistic intervention approach that has been shown to increase children's expressive language skills and EMT has been taught using FGRBI coaching strategies (Brown & Woods, 2015). There is promising but limited evidence that a naturalistic teaching approach could be used to teach motor skills but this approach has not been implemented by caregivers at home. Neither FGRBI nor EMT has been studied as an

intervention approach for simultaneously embedding instruction for both motor and communication skills within the same routines.

Context for the Current Study: The Embedded Practices and Intervention with Caregivers Project

The current study took place as part of the Embedded Practices and Intervention with Caregivers (EPIC) project. EPIC is an ongoing multisite Goal 2 project funded by the Institute of Education Sciences for developing, refining, and evaluating an intervention designed to increase the capacity of caregivers to embed learning opportunities in their everyday activities to enhance learning for children with significant disabilities (www.epicintervention.com). The EPIC approach includes the following components:

- The FGRBI-SOOPR coaching framework.
- A five-question framework (5Q) used to guide caregivers in planning their children's intervention:
 - WHAT are the child's targets?
 - WHY are these targets important?
 - HOW will the caregiver teach the targets?
 - When/Where/Who will teach?
 - HOW will the caregiver know that the strategies are working?

The caregiver develops a visual model as a reminder of the 5Q for use throughout their day.

- A “frontloading” approach in which families participate in three intervention sessions during their first week of intervention, two interventions during their

second and third weeks of intervention, and one intervention session each week thereafter.

The Current Study

The current study took place during the second phase of the EPIC project, during which each project site conducted a single case research design (SCRD) study. The primary dependent variable for each of the studies was caregivers' use of correct learning trials (CLT; described below). The unique contribution of the current study was to examine whether one set of intervention procedures, EMT, which has previously been successfully implemented by therapists, teachers, and caregivers to improve communication skills in multiple routines with toddlers and preschool children, could be adapted and extended to caregiver-implemented intervention for teaching both communication and motor skills concurrently within and across routines. Primary dependent variables were related to caregiver implementation of CLT and EMT strategies. The effects of the caregiver-implemented intervention on child communication and motor target behaviors also were examined.

Research questions included:

1. Can the FGRBI-SOOPR coaching approach for teaching caregivers use of EMT strategies to address motor and communication skills be implemented with fidelity?
2. Is there a functional relation between the use of the EPIC coaching approach for teaching caregivers and caregivers' use of CLT and EMT strategies to address motor and communication skills?
 - a. Do caregivers provide more correct learning trials as a result of the intervention?

- b. Do caregivers use more individual EMT strategies as a result of the intervention?
 - c. Are the effects of the intervention on caregiver use of EMT strategies observed in both play and caregiving routines?
 - d. Are the effects of the intervention on caregiver use of EMT strategies observed across both communication and motor targets?
3. Do caregivers maintain their use of CLT and EMT strategies after intervention is completed?
 4. Do caregivers generalize EMT strategies for addressing both motor and communication skills in uncoached activities?
 5. Does caregiver use of EMT strategies result in increases in children's total and spontaneous use of motor and communication targets in play and caregiving routines?

Methods

Participants

Three caregiver-child dyads were recruited from the local early intervention agency and consented to participate in the study. Dyads were eligible to participate if (a) the child had a chronological age of 12 to 30 months; (b) the child was enrolled for at least weekly Part C services; (c) the child had been independently assessed as evidencing a significant developmental delay, defined as two standard deviations below the mean in one or more areas of development or included in an automatically eligible category as defined by the state EI agency (e.g. Down syndrome, cerebral palsy); (d) the child received services in the family's home; (e) the caregiver was willing to learn routines based intervention strategies; and (f) the caregiver provided informed consent for their child's participation, including completing all required measures, allowing videotaping during home visits, and allowing adjustments in the frequency with which coaches and research personnel visited their home. In order to enhance experimental control for

examining effects of intervention on communication and motor domains for children with significant disabilities, children who were diagnosed with autism spectrum disorders were excluded from the study.

Child participants. Child participants were 15 to 23 months of age at the start of the study. Each child had an established significant disability (e.g., Down syndrome, microcephaly). Each experienced severe delays in both communication and motor skills. Participant characteristics are described in Table 3, participant amounts and types of EI services received are described in Table 4, and participant assessment results are described in Table 5. In each dyad, the participating caregiver was the mother.

Interventionist. The intervention was implemented with each of the three families by one early intervention provider. The provider had a doctoral degree in speech and language pathology and three years of experience applying a family-guided, caregiver implemented approach with infants and toddlers and families. The provider had participated in a previous model demonstration project which utilized both FGRBI and EMT strategies to support communication development for children birth to three years. Prior to beginning intervention, the provider participated in a multicomponent online training including narrated modules explaining strategies, video examples of each intervention component, and additional published resources. The provider completed two quizzes and watched abbreviated home visit videos to identify coaching practices. Prior to beginning intervention, the provider was required to score two videos with 80% reliability. Utilizing one provider across all families prevented the possibility of obtaining provider related effects for individual families.

Settings and Materials

All assessment and intervention activities took place in participants' homes. The

participating caregiver, child, and interventionist were present for all sessions. A videographer who was not the interventionist video recorded all baseline, intervention, and maintenance sessions using a handheld digital video camera and tripod. During baseline, each family identified two routines based on their typical preferences, activities, and priorities. These were the activities filmed in baseline and intervention sessions. Only the materials that the family typically used in those routines were used by the caregiver and child.

During intervention, the interventionist provided a handout describing the four EMT strategies, and the EMT strategies were reviewed in each session (See Appendix A). To guide the caregiver in embedding instruction in between intervention visits, the caregiver and provider completed or reviewed a “Visual Model” at the end of each intervention session, discussing how the caregiver would embed instruction (EMT strategies), when/where/who (routines, partners) would embed intervention, why the targets or strategies were important, and how the caregiver would know if strategies were working (See Appendix B).

Materials used in generalization probes were the family’s materials which were typically used in the family’s identified activities and a bag of materials provided by the project. The materials provided by the project included a large popup book, a touch and feel book, a toddler puzzle with chunky pieces, a noisy ball toy, two rattles, a baby’s comb, a small stuffed animal, a cup, a spoon, and blocks. Each caregiver was asked to film one generalization probe per week during the baseline and intervention conditions, and a handheld digital camera and a mini-tripod were provided to each family so that they could film generalization activities during their preferred times.

Design

The design for the study was a multiple probe across caregiver-child dyads. SCRD is

well-suited for studying interventions with low-incidence populations because each individual serves as his or her own control and a large sample of participants is not required to demonstrate experimental control (Kratochwill et al., 2010). Additionally, SCRD is appropriate for use in authentic settings because frequent observational data collection documents changes in the individual dyad related to implementation and growth over time. Finally, the replication across participants serves to enhance external validity (Kennedy, 2005; Kratochwill et al., 2010).

The primary dependent variables in this study were the caregiver rate per minute of correct learning trials (CLT) used in each session (number of CLT divided by number of minutes of caregiver-child interaction) and the number of EMT strategies used by caregivers. Data from each session were coded, summarized, graphed, and visually examined prior to the next session. The criterion for beginning the intervention with the first dyad was a stable rate of caregiver CLT during baseline. During the baseline condition, Dyads 2 and 3 each completed one weekly probe session. When the first dyad demonstrated a change in level or trend of CLT, Dyad 2 completed three consecutive baseline sessions (three sessions within a seven day period), and began intervention when baseline data were stable. Dyad 3 followed the same process.

Caregiver rate per minute of CLT and number of EMT strategies used for the communication target and the motor target in the play routine and the caregiving routine were also examined. Child rate per minute of total and spontaneous use of targets was examined for each session. Child rate per minute of total and spontaneous use of the communication target and the motor target in each routine was examined.

Measures

Assessments. The provider and each caregiver completed a demographic form. The provider reported information relating to her educational and professional background and

experience, knowledge and training related to significant disabilities, routines based interventions, and family guided intervention. Caregivers provided information about family demographics, child disability, child health history, childcare arrangements, and community services received by the child and family. The following measures were administered to characterize each child's development at the beginning of the study: ABILITIES® Index (Simeonsson & Bailey, 1991), Mullen Scales of Early Learning (MSEL; Mullen, 1995), Infant Growth and Development Indicator – Early Communication Indicator (IGDI-ECI; Walker & Carta, 2010); Infant Growth and Development Indicator – Early Motor Indicator (IGDI-EMI; Greenwood & Carta, 2010). Assessment results are displayed in Table 5. Finally, the Assessment, Evaluation, and Programming System-Second Edition (AEPS; Bricker, Capt, & Pretti-Frontczak, 2002) was administered through observation and parent interviews during the assessment phase of the study, and, together with family identified priorities, the AEPS was used to develop motor and communication targets for the intervention.

Observational Measures.

Embedded Instruction Observation System-Early Intervention (EIOS-EI)

(Snyder, Reichow, Bishop, & Embedded Instruction for Early Learning Projects, 2015).

Caregiver implementation of correct learning trials (CLT) was coded using continuous event sampling. The EIOS-EI is a direct observation system designed to quantify the occurrence and accuracy of embedded instruction learning trials implemented during family identified routines and activities. The EIOS-EI is adapted from the Embedded Instruction Observation System (EIOS, Snyder et al., 2009) for coding embedded instruction trials delivered by preschool teachers during ongoing classroom activities. Learning trials are considered to be correct when 1) an antecedent is correctly administered (as defined by the EIOS-EI), the child performs the

target behavior, and a logical consequence is provided; 2) the child spontaneously performs the target behavior and a logical consequences is provided; or 3) an antecedent is administered, the target behavior is not performed, and the adult provides extra help for the child to perform the target behavior. If the child does not perform the behavior and no extra help is provided, the trial is considered to be incorrect. If the child spontaneously performs the behavior (no antecedent was provided) but the adult fails to respond, the trial is considered to be incorrect. The EIOS-EI was used to quantify frequency and rate of CLT, the frequency and rate of child targets, and the frequency and rate of spontaneous child targets. Learning trials which were and were not occasioned by EMT strategies were coded. The original coding sheet for the EIOS-EI includes the presence of antecedents, child target behaviors or approximations, and consequences or extra help. The EIOS-EI allows for CLT to be scored when the child receives an environmental consequence that is not intentionally delivered by the adult. Because change in caregiver behavior was the primary outcome in this study, only CLT including adult-administered consequences were included in the analysis. In addition, when EMT strategies were used to initiate learning trials, the specific strategy was included with each coded trial. An example CLT coding sheet is displayed in Appendix C. Child target behaviors, acceptable approximations, and further clarification (e.g., behavior that would not be coded as targets) are provided in Table 9. A cumulative rate per minute for the entire session, as well as rate per minute for each target in each routine was derived.

Types of Adapted EMT Strategies. The specific strategy that the caregiver used in each learning trial was coded from each videotaped interaction using an event-recording measure. For the purposes of this study, EMT was comprised of four strategies (environmental arrangement, contingent responding, wait time, and prompting procedures). Each time one of these strategies

was used by the caregiver, the coder noted the time and the strategy used. See Table 1 for a list of EMT strategies applied to motor and communication targets.

Caregiver Reports.

Caregiver Diary. To describe the extent of caregiver and provider implemented intervention received outside of EPIC sessions, each caregiver was asked to complete a weekly diary. The diary included number of minutes of each type of service received as well as the specific goals or targets of each EI session. The caregiver was asked to record the routines in which he or she used the “how” strategies, the duration of the routines, which strategies were used, and which target was addressed. See Appendix D for the caregiver diary form.

Caregiver Feedback Survey. After the intervention was complete, each caregiver completed a feedback survey with a series of 12 questions. Caregivers were asked to rate the features of the approach on a scale of 1 to 5, with 1 representing “Not at all useful” and 5 representing “Very useful.” In addition, they answered two questions pertaining to their continued use of strategies in the intervention routines and other routines. See Appendix E for the Caregiver Feedback Survey form.

Procedural Fidelity

Procedural fidelity on provider implementation of the coaching components was completed for all intervention sessions by an undergraduate coder. Procedural fidelity was scored using a 12-item fidelity checklist (Appendix F). Mean procedural fidelity for the provider was 89% (range: 75-100%). Two items on the checklist were consistently absent: reviewing how current targets, routines, or strategies connect to larger outcomes, and discussing options on what to do when, how, and how often in current or future routine or activity to teach or support the identified child targets.

Interobserver Agreement (IOA). A minimum of 30% of sessions for each caregiver-child dyad in each condition were randomly selected and independently coded by a second coder to ensure ongoing reliability for each coding system (Procedural Fidelity Checklist, EIOS-EI, EMT). IOA for each coding system was calculated on a point by point basis. Percentage of IOA for each system was calculated by dividing the total number of agreements by the total number of agreements plus disagreements. Mean reliability for the procedural fidelity checklist was 86% (range 82 to 94). Mean reliability for correct CLTs was 88% (range 75 to 100). Mean reliability for EMT strategies was 84 (range 50 to 100). Mean reliability for child target behavior was 90% (range 71 to 100). The investigator also graphed and visually analyzed IOA data and compared to primary data graphs to ensure that data patterns for each participant in each condition were similar to those in primary data graphs.

Procedures

Assessment and Target Selection. After each family consented to participate in the study, two assessment visits occurred. In addition to assessments, the provider used the “Identifying Family Routines & Activities” form, Appendix G, to discuss the family’s priority routines and outcomes, as well as targets currently being addressed in EI services. Using the information obtained during assessments and priorities identified by the family, the family and provider jointly identified one communication target outcome and one motor target outcome for the intervention, and identified a caregiving routine and a play routine in which the caregiver and child would engage during intervention sessions. The targets identified for intervention were separate from those that the parent reported were addressed in other EI services. Child motor and communication targets and acceptable approximations are described in Table 5.

Baseline. Activities in each baseline session consisted of the play routine and the

caregiving routine that were identified by the parent and provider during assessment visits. Up to five minutes of each routine were recorded and coded, for a maximum total of ten minutes per baseline session. Parents were instructed to “do what you would normally do” during baseline activities. The number of baseline sessions ranged from five to eight.

Caregiver interview and introduction to intervention approach. Following completion of the baseline sessions, the caregiver participated in a one-hour session in which she watched a videotape of routines from the last baseline, and was asked to describe what she did to teach her child during the routines. Following this videotaped probe interview, the provider introduced the SOOPR approach, the EMT “How” Strategies, and the Visual Model.

Intervention. During the first week of intervention, each dyad participated in three intervention sessions. During the second and third weeks of intervention, each dyad participated in two intervention sessions. For two dyads, the final three weeks of intervention consisted of one intervention visit per week. For the third dyad, after a break between visits, two sessions were conducted in the fifth intervention week.

Each intervention session followed the SOOPR triadic coaching framework. During the Setting the Stage portion of each visit, the provider gathered updates and the provider and caregiver reviewed targets, strategies, and identified routines, and planned for which strategies could be embedded and how to support the child to use their target behaviors during routines. During observation and opportunities, the provider first observed the caregiver and child in an identified routine, and then engaged in specific coaching strategies to support the caregiver in embedding EMT strategies during the routine. Specific coaching strategies included direct teaching, caregiver practice, guided practice, demonstration with narration, general feedback, and specific feedback intended to enhance caregiver confidence and competence in embedding

intervention. Throughout each session, the caregiver and provider engaged in problem solving and reflection on the success of strategies and routines to determine what, if any, additional supports were needed, and to expand strategy or target use. At the end of each session, the provider and caregiver created or reviewed a visual model which served as the caregiver's action plan for "what" they would work on with their child, "where/when/who" (routines and partners), "how" (EMT strategies), "why", and how they would know "is it working" in between sessions. These five questions (5Q) were referenced throughout each session.

Maintenance probes. Families participated in up to five maintenance probes. Maintenance probes followed a similar protocol to baseline sessions. Caregivers and children engaged in their identified routines without any coaching, and also engaged in one additional (generalization) routine identified by the caregivers. Maintenance probes were recorded by a videographer who asked the caregiver to "do what you would normally do" in each activity.

Generalization probes. Each caregiver was provided with a digital video flip camera, a mini tripod, and the bag of materials provided by the project (described above). The caregiver was asked to videotape herself and her child a) playing with the bag of materials provided by the project for three to five minutes, b) playing with the family's materials for three to five minutes, and c) engaging in a caregiving routine for three to five minutes. Caregivers were asked to complete one generalization probe per week throughout baseline and intervention.

Results

Data on caregiver rates per minute of CLT, number of strategies, child total target use, and spontaneous child target use in the multiple probe design across dyads are displayed in Figure 1. Means and ranges for these caregiver behaviors in each condition are reported in Table 8. Rates of CLT, number of strategies, and child total target spontaneous child target use in play

and caregiving routines for communication and motor targets for each dyad are displayed in Figures 2, 3, and 4. Means and ranges for caregivers' rate per minute of CLT and mean number of strategies used across each routine for each target by experimental condition are reported in Table 9. Means and ranges for child total and spontaneous target use across each routine for each target are reported in Table 10.

Correct Learning Trials, Number of Strategies, and Child Target Use by Session

Dyad 1. Data for caregiver rate of CLT and number of strategies used and child rate of total and spontaneous target use for the multiple probe design across dyads are displayed in Figure 1; means and ranges are reported in Table 8. Caregiver 1 used a low rate of CLT and one strategy in each baseline session. Immediate changes in rate of CLT and in number of strategies were observed upon introduction of the intervention. Caregiver rate of CLT and the number of strategies used decreased but remained above baseline levels during the two maintenance sessions. During baseline the overall rate of target use for Child 1 was low. When intervention was introduced, child targets showed a similar change in trend and level to that observed in the caregiver's CLT rate. Most observed child targets occurred in response to an antecedent; however, some spontaneous target use occurred during the final intervention sessions. An increase in both total and spontaneous target use was observed during maintenance.

Dyad 2. Caregiver 2 used a low rate of CLT throughout baseline. Immediately upon introduction of the intervention, a shift in level was observed for both rate of CLT per minute and number of strategies used. During the five maintenance sessions, the caregiver rate of CLT was more variable, but remained near intervention levels. The number of strategies used by the caregiver decreased during maintenance but remained above baseline levels. The total rate of target use for Child 2 was low throughout baseline. During intervention, the rate of child target

use showed a change in trend and level similar to that observed in the caregiver's CLT rate. Most observed targets occurred in response to an antecedent; however, some spontaneous target use occurred in all intervention sessions. During maintenance, child total target use declined but remained above baseline levels; spontaneous target use increased. See Figure 1 and Table 8.

Dyad 3. Caregiver 3's baseline rate of CLT and number of strategies used were low and stable. Immediately upon introduction of the intervention, an increase was observed in level for rate of CLT and the number of strategies used. The rate of CLT returned to baseline levels during the first two maintenance sessions and was above baseline levels in the third session. Number of strategies used by the caregiver decreased during maintenance but remained above baseline levels. During baseline, the rate of total child target use was low. When intervention began, a shift was observed in trend and level. Most observed child target use occurred in response to an antecedent; however, some spontaneous target use occurred in all intervention sessions. During maintenance, both total and spontaneous target use decreased but remained above baseline levels. See Figure 1 and Table 8.

Correct Learning Trials, Number of Strategies, and Child Target Use for Each Target in Each Routine

Dyad 1. The rate per minute of CLT, the number of strategies, and rate per minute of child communication and motor targets during play and caregiving routines are displayed in Figure 2. Means and ranges for each target and each routine for all dyads are reported in Tables 9 and 10. During baseline, the caregiver's rate per minute of CLT and number of strategies for teaching the communication target were zero across play and caregiving routines. During intervention, the rate of caregiver CLT and number of strategies used for the communication target increased in both caregiving and play routines. The caregiver used up to four strategies to

elicit the communication target in both caregiving and play routines. The strategy used least often for the communication target was environmental arrangement. During maintenance, caregiver CLT and strategy use to teach communication in play returned to baseline levels while CLT and strategy use during the caregiving routine remained above baseline levels. Child use of the communication target was zero during baseline in play and caregiving routines. An increase in overall communication target use was observed in both routines. During maintenance, rate of total and spontaneous communication target use returned to baseline levels in the play routine and was at baseline level for one of two maintenance sessions in the caregiving routine. In the second maintenance session, there was an increase in rate of total but not spontaneous target use.

The rate of caregiver CLT and number of strategies used to teach the motor target in the play routine were zero for the first four baseline sessions; one CLT and one strategy were observed in the last baseline session. An increase in rate of CLT and number of strategies used to teach the motor target was observed in the play routine during six of ten intervention sessions. CLT for the motor target during the play routine increased during maintenance and number of strategies used was above baseline levels. During the caregiving activity, the caregiver's rate of CLT for the motor target remained low during intervention and maintenance. The caregiver used only one strategy during baseline, and used up to two per session in intervention, but use of strategies in maintenance returned to baseline levels. The caregiver used up to three strategies in play and up to two strategies to teach the motor target during caregiving. When a strategy was used for the motor target in baseline sessions, the strategy was prompting. Prompting and wait time were the most frequently used strategies in both routines during intervention sessions. There was no observed change in child motor target use in the play or the caregiving routine.

Dyad 2. Caregiver rate of CLT, number of strategies, and child target use for communication and motor targets in play and caregiving are displayed in Figure 3. Caregiver 2's rate of CLT and number of strategies used were low and stable for each child target in each routine. Immediately upon introduction of the intervention, an increase in both CLT rate and number of strategies was observed for communication targets in the play routine. Caregiver 2 used three or more strategies in eight of the ten sessions. The caregiver used each of the four possible strategies during the play routine in at least one session for the communication target. In the caregiving routine, a more gradual increase in rate of CLT was observed, followed by a decrease in the rate. Caregiver 2 consistently used at least one strategy (wait time or contingent responding) to elicit the child's communication target during the caregiving routine. Caregiver rate of CLT and number of strategies used remained above baseline levels during maintenance sessions. An increase was observed in total child communication target use in each of the routines. Some spontaneous use of the child's communication target was observed in play and caregiving routines during intervention and maintenance conditions.

Caregiver 2's rate of CLT and number of strategies to teach the motor target was low and stable in both play and caregiving routines during the baseline condition. An increase in CLT was initially observed in the play routine, but the rate of CLT decreased after the third session. An increase in the number of strategies used was observed during intervention. The caregiver used prompting and wait time strategies most often during the play routine. All four strategies were used in at least one session. Number of strategies used for motor targets in the play routine remained above baseline levels during maintenance, and CLT rate remained above zero. A gradual increase in the rate of CLT for the motor target was observed in the caregiving routine, and the rate of CLT remained above baseline throughout the intervention and maintenance

phases. The caregiver consistently used prompting (hand over hand assistance) and wait time to encourage use of the motor target in the caregiving routine. Child total use of the motor target remained low, although there was a slight increasing trend during the caregiving routine at the end of intervention. This increase did not continue through the maintenance phase, although a slight increase in total use of the motor target was observed in the play routine during the maintenance phase. No effects on spontaneous use of the motor target were observed.

Dyad 3. Rate of CLT, number of strategies, and child total and spontaneous target use for each target in each routine are displayed in Figure 4. In the play routine, with the exception of the first baseline session in which the child babbled several times (and the caregiver responded), caregiver rate of CLT and number of strategies used to elicit the communication target was zero during baseline sessions. During intervention, caregiver CLT rate for communication was above zero for seven of eleven sessions. The caregiver used up to two strategies during the play routine to elicit the communication target. In the caregiving routine, the rate of CLT and number of strategies used for the communication target for all but one baseline session were zero. Starting with the fourth intervention session, an increase in rate of CLT and number of strategies used was observed. During both routines, wait time and contingent responding strategies were used to elicit the communication target. Caregiver CLT rate and number of strategies returned to baseline levels during maintenance sessions. During intervention, a slight increasing trend in total and spontaneous child communication target use was observed in both routines. Both rates decreased during maintenance sessions.

Caregiver 3's rate of CLT and number of strategies used to elicit motor targets during both routines were low and stable in the baseline condition. When intervention began, an immediate shift was observed in the rate of CLT and number of strategies for the motor target

used during the play routine. The caregiver used wait time, prompting, and environmental arrangement strategies to elicit the child's motor target during the play routine. During the maintenance condition, CLT rate and number of strategies remained above baseline level. Rate of CLT and number of strategies used to teach the motor target in the caregiving routine increased during intervention, but were variable. Increases in caregiver behaviors to teach the motor target in the caregiver routine did not continue into maintenance sessions. An increase in child total motor target use during play was observed during intervention and continued through the maintenance condition. No increase was observed in spontaneous use of the motor target. During the caregiving routine, increases in the rate of overall target use were observed in three sessions, which corresponded with sessions for which the rate of CLT was high. Total and spontaneous child motor target use in caregiving returned to baseline levels during the maintenance condition.

Generalization

Caregiver-Collected Generalization Probes. Caregiver-collected generalization probe data are reported in Tables 11-13. Dyad 1 completed two generalization probes during baseline condition and one generalization probe during the intervention condition. Overall increases in CLT and child total target use were observed during the intervention phase. The number of strategies used did not increase from baseline to intervention probes. During the baseline probes, CLT were observed only for the communication target. In the intervention probe, CLT were observed for both the communication and motor targets. In the baseline probes, total rate of child target use was zero; in the intervention probe, the child's rate per minute of total target use in the caregiver probe was 0.78. Given the limited sample of data, these results should be interpreted cautiously.

Dyad 2 completed two generalization probes during the baseline condition and two generalization probes during the intervention condition. There were no observed increases in CLT, number of strategies used, or in child targets. The caregiver used the EMT strategies for both targets in both routines.

Dyad 3 completed a generalization probe during the baseline condition; however, the video file became corrupted and was not codable, thus it was not possible to compare the probes across phases. The caregiver collected two generalization probes during intervention. During intervention, rate of CLT, number of strategies, and rate of child target use were above zero, but were below those observed in intervention sessions.

Caregiver Diary Reports. Caregiver 1 completed six weekly diaries. She reported using the EMT strategies in meals, play, dressing, hygiene activities, and while sharing books. She reported that she used the strategies in routines and activities on average for seven hours per week (Range 4.83-10.33 hours). She reported using an average of three of the strategies (Range 2-4); environmental arrangement was the least frequently reported strategy.

Caregiver 2 completed six weekly diaries. She reported using the EMT strategies in meal, play, dressing, hygiene, and book. She reported using the strategies in routines and activities for an average of 16.73 hours per week (Range 7.0-22.33). For all but one week, she reported using all four of the strategies. Caregiver 2 gave specific examples of each strategy used in routines.

Caregiver 3 completed four of the six weekly diaries. She reported using the EMT strategies in meal, play, dressing, and hygiene activities, for an average of 10.48 hours per week (range 9.92-11.25). She reported using all four of the intervention strategies for all but the first week of intervention.

Social Validity

Following the intervention, each caregiver completed the caregiver feedback survey (Appendix E). Each caregiver reported that they found the approach of using the family's everyday routines, activities, and materials for teaching and learning, coaching from the provider, having more frequent sessions early in the intervention phase, and the use of the five questions to guide their intervention planning to be very useful. One caregiver reported that she did not find the visual model itself at all helpful. All caregivers reported that they continued to use the EMT strategies in the routines they had practiced with their provider multiple times each day. Further, each caregiver reported that she used the strategies daily in additional routines in which she had not been coached by the provider. Finally, all caregivers reported that they felt more confident in teaching their children new skills after participating in the intervention.

Discussion

The purpose of this study was to extend the research on caregiver-implemented interventions for infants and toddlers with significant disabilities by examining the effects of an intervention using FGRBI-SOOPR coaching strategies to teach caregivers the use of EMT procedures to concurrently address their children's communication and motor targets across routines. The effects of caregiver use of EMT procedures on children's use of target communication and motor skills were also explored. Consistent with a cascading model of intervention, fidelity of provider implementation of the FGRBI coaching strategies, caregiver implementation of EMT across behaviors and routines, and child target outcomes were measured throughout the study.

Each of the three caregivers demonstrated an immediate increase in their rate of CLT as well as the number of EMT strategies used during the intervention. Importantly, caregiver CLT rate and number of strategies remained above baseline levels during maintenance. Changes in

level and trend were observed in child total target use during intervention. Spontaneous target use increased for all participants, and remained above zero throughout maintenance for one of the three children. These data provide evidence of a functional relationship between implementing the FGRBI coaching approach for teaching EMT strategies to caregivers and caregiver implementation of EMT embedded in caregiving and play routines and indicate that caregiver use of EMT strategies was associated with positive changes in child target motor and communication behaviors.

These findings contribute to the literature on early intervention for infants and toddlers with significant disabilities in several ways. First, the results add to the evidence base demonstrating the effectiveness of teaching parents to implement embedded instruction with their children. Specifically, this study demonstrated that FGRBI-SOOPR coaching procedures are effective in teaching parents, extending the findings of previous studies (Brown & Woods, 2015; Kashinath et al., 2006). Second, these findings replicated findings that caregiver implemented EMT improves child communication skills (e.g., Kaiser & Roberts, 2013; Roberts et al., 2014; Wright et al., 2013), and extended the use of EMT procedures to demonstrate its potential effectiveness for teaching motor targets. Third, findings from this study suggest that caregiver-implemented strategies can be an efficient means of teaching caregivers to support child use of motor and communication targets. The changes in caregiver and associated child behaviors occurred during a relatively short intervention (10 to 11 sessions, six weeks) in comparison to the 24 to 36 sessions (12-16 weeks) previously reported for naturalistic interventions (e.g., Kaiser & Roberts, 2013a; Woods & Brown, 2015). The use of one set of intervention strategies for promoting growth in skills across domains in a short term intervention reduces the effort expended by providers for teaching strategies across multiple domains, and

potentially reduces the number of intervention procedures parents need to learn in order to support their children's development across domains. This was a short term intervention limited to specific routines and targets; while the selection of specific routines may have constrained opportunities for practicing motor targets, the combination of family selected activities and repetition across the intervention may have served to promote teaching and acquisition of communication targets. Further research is needed to determine whether the effects of such short term intervention may maintain for longer periods and generalize across more activities and broader targets.

This study extends the evidence base regarding who may benefit from EMT to include children 15-23 months of age who were pre-symbolic in their language, and who had significant motor or visual impairments. While Prelinguistic Milieu Teaching (PMT; e.g., Yoder & Warren, 2002) has been used with this age group to teach prelinguistic communication skills, it has not been previously used with children who have significant motor needs. EMT has not been previously tested with this population.

Finally, this study meets the three criteria for evidence in a cascading intervention model. The study included fidelity measures of the provider's use of the FGRBI-SOOPR coaching procedures for teaching EMT to caregivers, observational measures of the quality and quantity of the caregiver's implementation of the intervention and observational measures child use of target skills associated with the intervention. Assessments of generalization and maintenance by caregivers and children are important quality features of the study.

Although the overall outcomes of the study were positive, there was some variability in outcomes within and across caregiver-child dyads. Generally, there were increases in rate of CLT and number of strategies used to teach both communication and motor targets in both the

play and caregiving routines for all three caregivers. In most sessions, each caregiver taught both communication and motor targets in both routines. The rates of CLT and number of strategies used across routines and targets differed across families, across targets within families, and across strategies. It is possible that these differences are related to the match between targets, routines, and strategies. Caregiver 1 identified the use of two hands as a priority target, and meal time as a priority routine, but feeding was also a priority. While she was able to embed strategies for the communication target in the caregiving routine, it was a challenge to focus on three targets (eating, communication, and motor). For Dyads 2 and 3, the number of strategies used varied by target. For Dyad 2, contingent responding in the form of modeling would not have been effective due to the child's visual impairment. For Dyad 3, contingent responding was not used to elicit the motor target, pulling up. For Dyad 3, prompting and environmental arrangement were not used to elicit the vocalization target.

It is possible that maintenance and generalization were constrained by the research design as well as by the match to family priorities, routines, and strategies. To enhance internal validity, routines were limited to two routines identified during assessments, and child targets were limited to ones not being taught in other EI instruction. This may have resulted in selection of targets and routines that were not a good contextual match for one another (e.g., opportunities to pull up were limited in caregiving routines; opportunities to use both hands together may have been limited in a snack routine in which feeding was a challenge). Additionally, a simple count of strategies or numbers of total strategies used may not be an adequate measure of the quality of embedded instruction by caregivers. For some communication and motor targets, all four EMT strategies could have served as antecedents to elicit the target behaviors. For other targets only

one to two of the strategies may have been appropriate. These differences may have contributed to the variable outcomes across dyads.

Limitations

This study has specific limitations. First, while functional relationships were demonstrated during intervention, there were limited data assessing generalization of caregiver or child outcomes across routines and targets. An innovative approach to collecting home data (parent collected video) reduced the reactivity of the data collection by an outside observer, but also resulted in a small number of generalization assessments. Having caregivers video themselves may have improved their performance during the probes, but without more data it is not possible to determine this. Second, in order to operationally define behaviors, child targets were narrowly defined and observed increases may not have been representative of changes in broader communication or motor skills. For example, while a particular child may have increased his vocalizations with his mother, it is not clear whether his communication improved in terms of diversity and function or across contexts. Third, the intervention was relatively short in duration and was limited to two routines. While evidence of efficiency is important as discussed above, longer intervention across additional activities might have resulted in greater generalization and stronger maintenance by caregivers and children. A longer intervention would also allow the opportunity for the provider to coach the caregiver in applying EMT strategies to new child targets as initial motor and communication targets are acquired. Fourth, while maintenance data were promising, the maintenance phase was relatively short (up to five weeks); a longer maintenance phase would provide stronger evidence of the caregivers' and children's maintenance. Finally, while provider implementation of coaching strategies, caregiver implementation of intervention strategies, and child target outcomes were each measured and

showed promising results, neither a fidelity criterion for caregivers nor a benchmark for child progress was established prior to intervention.

Implications

This study has several implications for practice and future research related to delivering early intervention services for children with significant disabilities. The successful use of the FGRBI-SOOPR to coach caregivers to use EMT strategies for both communication and motor targets supports both the viability of a family guided caregiver coaching approach and the use of one set of naturalistic intervention strategies for teaching skills across multiple domains. This evidence adds to a growing body of research on the effectiveness of caregiver implemented interventions and adds evidence that caregiver implemented interventions can be effective with children who have multiple disabilities. The differences in preferred routines and targets among the three families highlight the need for identifying the family's priorities for targets and routines, and to address the contextual match among child targets, family routines, and teaching strategies in both research and practice (Woods, Kashinath, & Goldstein, 2004). Given the complex needs of families with children with multiple disabilities, it is especially important to identify instructional strategies that match these needs.

Future research is needed to replicate these results and to refine the approach. This research should also establish criteria for parent use of EMT based on levels associated with strong child outcomes and criteria for fidelity of the FGRBI coaching approach. In addition, child outcomes should be examined to establish benchmarks for sufficient child progress. Further research is needed to determine if EMT can be used to teach other developmental targets (e.g., social skills, self-care skills) and in additional caregiver selected activities. Future studies could be designed to systematically program for caregiver and child generalization and

maintenance across contexts and skills by teaching across more activities, fading caregiver coaching, and teaching self-monitoring or data collection strategies to track caregiver implementation and child progress.

Conclusions

Children with significant disabilities have complex needs that often require intervention in multiple domains (Salisbury & Copeland, 2013). However, there is a dearth of evidence-based practices for addressing the multiple needs of infants and toddlers with significant disabilities. The results of this study add to a growing body of evidence that the FGRBI approach is an effective way to teach caregivers to use naturalistic strategies to support their children's development. The study also provides evidence that FGRBI and EMT can be implemented by caregivers across routines to address at least two developmental domains. Third, this study provides evidence that use of EMT strategies may result in increases in child use of both communication and motor targets. However, the amount of correctly embedded instruction varied across families, targets, and routines, and evidence of generalization was limited. In summary, while this study provides systematic evidence of the effects of teaching a naturalistic intervention strategy to caregivers and the effects of the intervention on child targets, the scope of the study is modest and replications are needed to establish the effectiveness of both the coaching model and the application of EMT across developmental domains. It is important that researchers and practitioners continue to develop and evaluate intervention approaches that occur in natural environments, enhance the capacity of caregivers to support their children's development, and that can be implemented across multiple domains to address the complex needs of children and families.

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Table 1

EMT Strategies Applied Across both Communication and Motor Domains

Adapted EMT Strategies	Communication examples	Motor examples
Environmental Arrangement		
Positioning	Position face to face to sustain engagement, communication	Position to support child and encourage movement
Choosing materials	Materials are of medium interest and at the child’s developmental level; materials require a partner	Materials require wrist rotation; materials are correct height for pulling up
Arranging materials	Limit materials to support engagement	Place toy to the child’s left to encourage head turning; place toy just out of reach on floor to encourage crawling
Assistance needed	Closed container with desired objects inside to encourage requesting	A toy with a knob, requiring child to attempt grasping/wrist rotation
Small portions	Small portions of snack so that child requests more	
Contingent Responding (Notice & Respond and Model & Expand)		
Notice & Respond	Respond to all child communication	Respond to target motor skill attempts, ensure logical consequence
Imitating & describing (Mirroring & Mapping)	Imitate child’s action and describe	Imitate child’s action and describe
Balanced Turn-Taking	Respond to child communication and wait	Put item in, wait for child’s turn; roll ball back and forth with child
Model	Model language that is just ahead of the child’s	Model banging blocks at midline, rolling ball, grasping and releasing
Expand	Repeat child’s communication and add new language	Imitate banging blocks and then stack a block
Wait Time (Time Delay)		
	Interrupt peekaboo game and wait for child to vocalize	Hold block in hand, wait for child to grasp and place in container
	Hold two choices and wait for child to indicate preference	Hold favorite toy in sight, wait for child to pull up or come to four point position.
	Wait for child to gesture “up” before taking from crib	
Prompting Procedures		
	Least to Most Prompting Hierarchy: Adult asks “what do you want?” Child points to car (his target behavior); Adult points and says “car!” before giving the car.	Least to Most Prompting Hierarchy Tell child to “Put the block in the bucket”; Repeat direction with a point to the bucket or nudging child’s arm toward bucket; Physically support child to place block in bucket; -OR- Most to Least Prompting Hierarchy Provide full hand over hand support to perform action and fade support as appropriate

Table 2

Participant Demographic Characteristics

	Child 1	Child 2	Child 3
Chronological Age at Entry (months)	23	16	15
Gender	Male	Female	Male
Ethnicity	Caucasian	Caucasian	Caucasian
Diagnosis	Down syndrome	Microcephaly Seizure Disorder Visual Impairment	Down syndrome
Caregiver age	31	21	31
Caregiver education level	High school graduate	Some college	College graduate
Household Income	\$40,000-50,000	\$20,000-30,000	>\$100,000

Table 3

Hours of Early Intervention Services Received per Month

	Child 1	Child 2	Child 3
Developmental Therapy			
Occupational Therapy	4	4	4
Physical Therapy	8		3
Speech and Language Therapy	4		4
Behavioral Therapy			
Vision Therapy		4	
Total Hours per Month	16	8	11

Table 4

Child Abilities at Baseline

Assessment	Child 1	Child 2	Child 3
MSEL			
Visual Reception (Mental age in months)	14	<1 ^a	12
Early Learning Composite	50	49	69
IGDI-ECI			
Weighted Total Communication rate per minute (Weighted Total Communication mean normed rate per minute) ^b	5.5 (11)	1 (7)	0.67 (6)
IGDI-EMI			
Total Raw Score rate per minute (Mean normed rate rate per minute) ^b	7.83 (10)	0 (7)	2.66 (6.0)

Note. MSEL = Mullen Scales of Early Learning; IGDI = Infant Growth and Development Indicator; ECI = Early Childhood Indicator; EMI = Early Motor Indicator.

^aChild 2 has a visual impairment; it was not possible to derive an accurate estimate of mental age or cognitive functioning given the weight of visual reception skills for the MSEL.

^bNormed rate per minute estimated from normed curves on child reports on www.igdi.ku.edu.

Table 5

Example Trials Using Enhanced Milieu Teaching Strategies

Domain	Strategy	Antecedent	Behavior	Consequence/Extra Help
Motor	Environmental	Ball placed on couch	Child pulls up	Child accesses toy
Communication	Environmental	Toy on high shelf	Child reaches and vocalizes	Caregiver says “you want the ball!” and gets the ball
Motor	Modelling	Caregiver stacks block	Child attempts to stack	Caregiver helps child stack and says “stack”
Communication	Modelling	Caregiver says “car”	Child says “cah”	Caregiver says “car” or “drive car” while playing
Motor	Wait time	Caregiver holds block and looks at child	Child grasps block and puts in bucket	Caregiver says “block in!!”
Communication	Wait time	Caregiver looks at child in crib	Child holds arms out and vocalizes	Caregiver says “up!” and picks child up
Motor	Prompt	Caregiver says “pull pants up”	Child grasps pants and pulls	Caregiver “you put your pants on!”
Communication	Prompt	Caregiver says ball or farmhouse?	Child points to farm.	(child’s target is word) Caregiver uses “say” prompt to elicit word and follows through with correction. (child’s target is gesture) Caregiver says “want the farm!” and gives farmhouse.

Table 6

Child Communication and Motor Targets

	Domain	Target	Examples	Further clarification
Child 1	Communication	Use a variety of gestures to request or comment.	Reach for item in adult's hand; reach for out of reach item, vocalize and look at adult; point to item; wave; give; show	Reaching for and obtaining items not in adult hands should not be coded as trial unless secondary indicators are present (e.g., vocalizes and looks at adult while reaching toward item).
	Motor	Use both hands functionally to engage with objects.	Steady toy with one hand while activating with another; hold cup with both hands while drinking; hold plate while scooping; alternate stacking with two hands.	
Child 2	Communication	Vocalize to request or comment.	Body is in a neutral position and mouth is open.	Sounds made while in tensed position, continuous sounds, and crying are not counted. "Reflexive" actions (e.g., entire body tenses and hands come together) are not counted
	Motor	Bring hands to midline to engage with object or caregiver.	Hold diaper or wipes at midline during changing; clap; squeeze toy at midline; bang toys at midline.	
Child 3	Communication	Vocalize using two syllables with consonants	Baba, mama, nana, dada	Instances when caregiver lifts and places him on his feet are not counted (child's feet must be on floor throughout transition).
	Motor	Pull to standing position.	Pull up while holding caregiver's hand, furniture, toy, on baby gate.	

Table 7

Caregiver Identified Routines and Example Strategies for Each Dyad

	Routines	Example Strategies to Promote Communication Target In Routine	Example Strategies to Promote Motor Target in Routine
Child 1	Eating	Caregiver holds spoon in one hand and cup in the other and waits for gesture; caregiver places cup on table out of reach.	Caregiver gives child cup; models use of both hands; uses hand over hand assistance to place hands on cup.
	Play with objects	Caregiver models pointing to objects; caregiver models balanced turn-taking.	Caregiver models using both hands to push a toy together; caregiver and child take turns playing with a toy that requires use of two hands.
Child 2	Diaper changing with stretching/ applying lotion	Caregiver models vocalization while stretching or wiping; caregiver pauses during stretching and waits for vocalization	Caregiver places diaper or clothing item on child's tummy; caregiver holds tub of wipes in front of child and waits for child to bring hands together, or places one of child's hands on tub.
	Social play and play with objects on floor	Caregiver takes turns vocalizing with child; caregiver builds routine of "ready set go" and pauses to allow vocalization.	Caregiver starts routine or song that includes hands together (clapping), sets up routine and pauses in routine; caregiver places toy on child's lap; caregiver provides toys that require pushing/touching to activate, uses environmental arrangement or prompting to teach child to hold and activate toy
Child 3	Diaper changing/dressing	Caregiver takes turns vocalizing with child, models words similar to target when appropriate ("up up up", "down down down", "wipe wipe wipe"); caregiver responds to all of child's vocalizations, adds to babble.	Before carrying to changing table, caregiver holds out her hands and waits for child to grasp and pull-up (starts with wait time and supports as needed); when it is time to put pants on, caregiver uses wait time to encourage child to pull up.
	Social play and play with objects	Caregiver responds to all vocalizations, takes turns babbling, models short words with easy sounds (up up up, down down down, push push push)	Caregiver places favorite objects on couch or other furniture item so that child must pull up (using furniture, toys, or caregiver's hand) to access; caregiver places object on head so that child pulls up to reach for it.

Table 8

Means and Ranges of Caregiver CLT Rate per Minute and Number of Strategies and Rate of Total and Spontaneous Child Target Use in Sessions

		CLT Rate per Minute	Number of Strategies Used	Rate of Child Target Use	Rate of Spontaneous Child Target Use
Dyad 1	Baseline	0.14 (0-0.25)	0.60 (0-1)	0.19 (0-0.38)	0.07 (0-0.13)
	Intervention	0.88 (0.23-1.53)	3.30 (2-4)	1.05 (0.52-1.67)	0.2 (0-0.75)
	Maintenance	0.94 (0.49-1.39)	2.50 (2-3)	0.84 (0.39-1.29)	0.15 (0.07-0.23)
Dyad 2	Baseline	0.17 (0-0.32)	0.67 (0-1)	0.26 (0-0.58)	0.10 (0-0.23)
	Intervention	1.47 (0.78-2.45)	3.50 (3-4)	1.83 (0.84-2.61)	0.56 (0.19-1.46)
	Maintenance	1.71 (1.01-2.41)	2.60 (2-3)	1.39 (0.57-2.41)	0.83 (0.4-1.64)
Dyad 3	Baseline	0.16 (0-0.6)	0.13 (0-1)	0.19 (0.00-0.80)	0.15 (0.00-0.60)
	Intervention	1.06 (0.56-2.15)	3.36 (2-4)	1.00 (0.50-1.98)	0.27 (0-0.76)
	Maintenance	0.69 (0-1.51)	1.67 (0-2)	0.73 (0.00-1.51)	0.48 (0-1.06)

Note. CLT = Correct learning trials.

Table 9

Means and Ranges of Caregiver CLT Rate per Minute and Number of Strategies for Communication and Motor Targets during Play and Caregiving Routines in Sessions

		Communication Target, Play Routine		Communication Target, Caregiving Routine		Motor Target, Play Routine		Motor Target, Caregiving Routine	
		CLT	Strategies	CLT	Strategies	CLT	Strategies	CLT	Strategies
Dyad 1	Baseline	0.04 (0-0.2)	0	0	0	0.13 (0-0.4)	0.20 (0-1)	0.13 (0-0.46)	0.40 (0-1)
	Intervention	0.54 (0-1.83)	2.00 (0-4)	0.82 (0.29-1.99)	2.30 (1-4)	0.37 (0.06-0.77)	1.80 (0-3)	0.08 (0-0.22)	1.20 (0-2)
	Maintenance	0	0	0.86 (0.30-1.42)	2.00 (2)	0.66 (0.34-1.11)	1.50 (1-2)	0	0.50 (0-1)
Dyad 2	Baseline	0	0	0.25 (0-0.76)	0.17 (0-1)	0.18 (0-0.4)	0.50 (0-1)	0	0
	Intervention	1.24 (0.63-2.05)	2.80 (1-4)	0.91 (0.08-1.80)	0.90 (0-2)	0.27 (0-0.52)	1.80 (1-3)	0.35 (0-0.81)	0.90 (0-2)
	Maintenance	1.05 (0.26-2.00)	2.00 (1-3)	0.88 (0-1.81)	0.80 (0-2)	0.66 (0.34-1.11)	1.60 (0-3)	0.87 (0.16-1.6)	1.00 (1)
Dyad 3	Baseline	0.13 (0-1)	0	0.15 (0-1.00)	0.13 (0-1)	0.05 (0-0.20)	0	0	0
	Intervention	0.54 (0.10-1.14)	1.45 (0-2)	0.57 (0-1.45)	0.91 (0-2)	0.60 (0.34-0.96)	2.09 (1-3)	1.44 (0-0.33)	1.18 (0-3.00)
	Maintenance	0.28 (0-0.45)	0.33 (0-1)	0.38 (0-1.14)	0.33 (0-1)	0.74 (0-01.36)	0.33 (0-1)	0	0.33 (0-1.00)

Note. CLT = Correct learning trials.

Table 10

Means and Ranges of Child Total and Spontaneous Communication and Motor Targets During Play and Caregiving Routines in Sessions

		Communication target, Play routine		Communication target, Caregiving routine		Motor target, Play routine		Motor target, Caregiving routine	
		Total	Spontaneous	Total	Spontaneous	Total	Spontaneous	Total	Spontaneous
Dyad 1	Baseline	0.09 (0-0.25)	0.09 (0-0.25)	0	0	0.24 (0-1.01)	0.07 (0-0.34)	0.09 (0-0.46)	0
	Intervention	0.88 (0-2.46)	0.17 (0-1.10)	0.91 (0.18-2.26)	0.21 (0-0.67)	0.62 (0-1.46)	0.17 (0-0.61)	0.08 (0-0.37)	0
	Maintenance	0	0	0.73 (0.17-1.30)	0	1.18 (1.11-1.26)	0.66 (0.36-0.97)	0	0
Dyad 2	Baseline	0.03 (0-0.2)	0.03 (0-0.20)	0.47 (0-1.53)	0.13 (0-0.40)	0.13 (0-0.40)	0.03 (0-0.2)	0	0
	Intervention	1.74 (0.79-2.73)	0.58 (0.17-1.65)	1.1 (0.31-2.24)	0.37 (0.06-0.77)	0.37 (0.06-0.77)	0.03 (0-0.15)	0.32 (0-0.81)	0.05 (0-0.29)
	Maintenance	1.26 (0.51-2.48)	0.72 (0.26-1.79)	1.23 (0.48-2.31)	0.33 (0.34-1.11)	0.66 (0.34-1.11)	0.03 (0-0.15)	0.23 (0-0.75)	0.07 (0-0.37)
Dyad 3	Baseline	0.13 (0-1.00)	0.13 (0-1.00)	0.20 (0-1.40)	0.13 (0-0.80)	0.05 (0-0.20)	.05 (0-0.20)	0	0
	Intervention	0.56 (0.10-1.35)	0.25 (0-0.82)	0.48 (0-1.58)	0.18 (0-0.079)	0.63 (0.20-1.26)	0.07 (0-0.63)	0.37 (0-2.17)	0.08 (0-0.72)
	Maintenance	0.28 (0-0.45)	0.28 (0-0.45)	0.5 (0-1.14)	0.5 (0-1.14)	0.60 (0-1.36)	0	0.13 (0-0.23)	0.08 (0-0.23)

Note. All numbers are rate per minute.

Table 11

Means and Ranges of Caregiver CLT Rate per Minute and Number of Strategies, and Rate of Total and Spontaneous Child Target Use in Caregiver Probes

		Rate of CLT	Number of Strategies Used	Rate of Child Target Use	Rate of Spontaneous Child Target Use
Dyad 1	Baseline	0.3 (0-0.67)	2 (0-4)	0	0
	Intervention ^a	0.78	3	0.78	0
Dyad 2	Baseline	0.58 (0-1.15)	1.5 (0-3)	0.66 (0-1.32)	0.10 (0.21)
	Intervention	0.64 (0.47-0.81)	2 (1-3)	0.71 (0.70-0.71)	0.33 (0.30-0.33)
Dyad 3	Baseline ^b				
	Intervention	0.71 (0.45-1.05)	2.7 (2-3)	0.66 (0.42-1.11)	0.27 (0.15)

Note. CLT = Correct learning trials.

^aOne probe

^bBaseline probe was lost to faulty video

Table 12

Means and Ranges of Caregiver CLT Rate per Minute and Number of Strategies for Communication and Motor Targets during Play and Caregiving Routines in Caregiver Probes

		Communication target, play		Communication target, care		Motor target, play		Motor target, care	
		CLT	Strategies	CLT	Strategies	CLT	Strategies	CLT	Strategies
Dyad 1	Baseline	0.33 (0-0.66)	1.5 (0-3)	00.11 (0-0.22)	0.5 (0-1)	0	0	0	0
	Intervention ^a	0	0	0.55	3	0	0	0.23	2
Dyad 2	Baseline	0.24 (0-0.49)	1.0 (0-1)	0.68 (0-1.35)	0.5 (0-1)	0.29 (0-0.58)	0.5 (0-1)	0.14 (0-0.27)	0.5 (0-1)
	Intervention	0.26 (0.12-0.41)	1.5 (0-3)	0.4 (0-0.8)	0.5 (0-1)	0.38 (0.35-0.41)	1	0	0
Dyad 3	Baseline ^b								
	Intervention	0.20 (0-0.42)	0.67 (0-1)	0.31 (0-0.86)	1 (0-2)	0.36 (0.15-0.53)	1.67 (1-2)	0.45 (0.16-0.68)	1.33 (1-2)

Note. CLT = Correct learning trials.

^aOne probe

^bBaseline probe was lost to faulty video

Table 13

Means and Ranges of Child Total and Spontaneous Communication and Motor Targets during Play and Caregiving Routines in Caregiver Probes

		Communication target, Play routine		Communication target, Caregiving routine		Motor target, Play routine		Motor target, Caregiving routine	
		Total	Spontaneous	Total	Spontaneous	Total	Spontaneous	Total	Spontaneous
Dyad 1	Baseline	0.38 (0-0.76)	0.05 (0-0.09)	0	0	0.05(0-0.05) 0	0.05 (0-0.05)	0	0
	Intervention ^a	0	0	0.55	0	0	0	0.23	0
Dyad 2	Baseline	0.25 (0-0.49)	0.05 (0-0.10)	0.68 (0-1.35)	0.27 (0.54)	0.39 (0-0.78)	0.02 (0-0.05)	0.14 (0-0.27)	0
	Intervention	0.31 (0.27-0.35))	0.24 (0.14-0.35)	0.40 (0-0.80)	0.40 (0-0.80)	0.31 (0.27-0.35)	0	0.2 (0-0.40)	0
Dyad 3	Baseline ^b								
	Intervention	0.13 (0-0.23)	0.09 (0-0.18)	0.31 (0-0.86)	0.14 (0-0.34)	0.39 (0.23-0.53)	0.13 (0-0.23)	0.40 (0.16-0.53)	0.08 (0-0.17)

Note. All numbers are rate per minute.

^aOne probe

^bBaseline probe was lost to faulty video

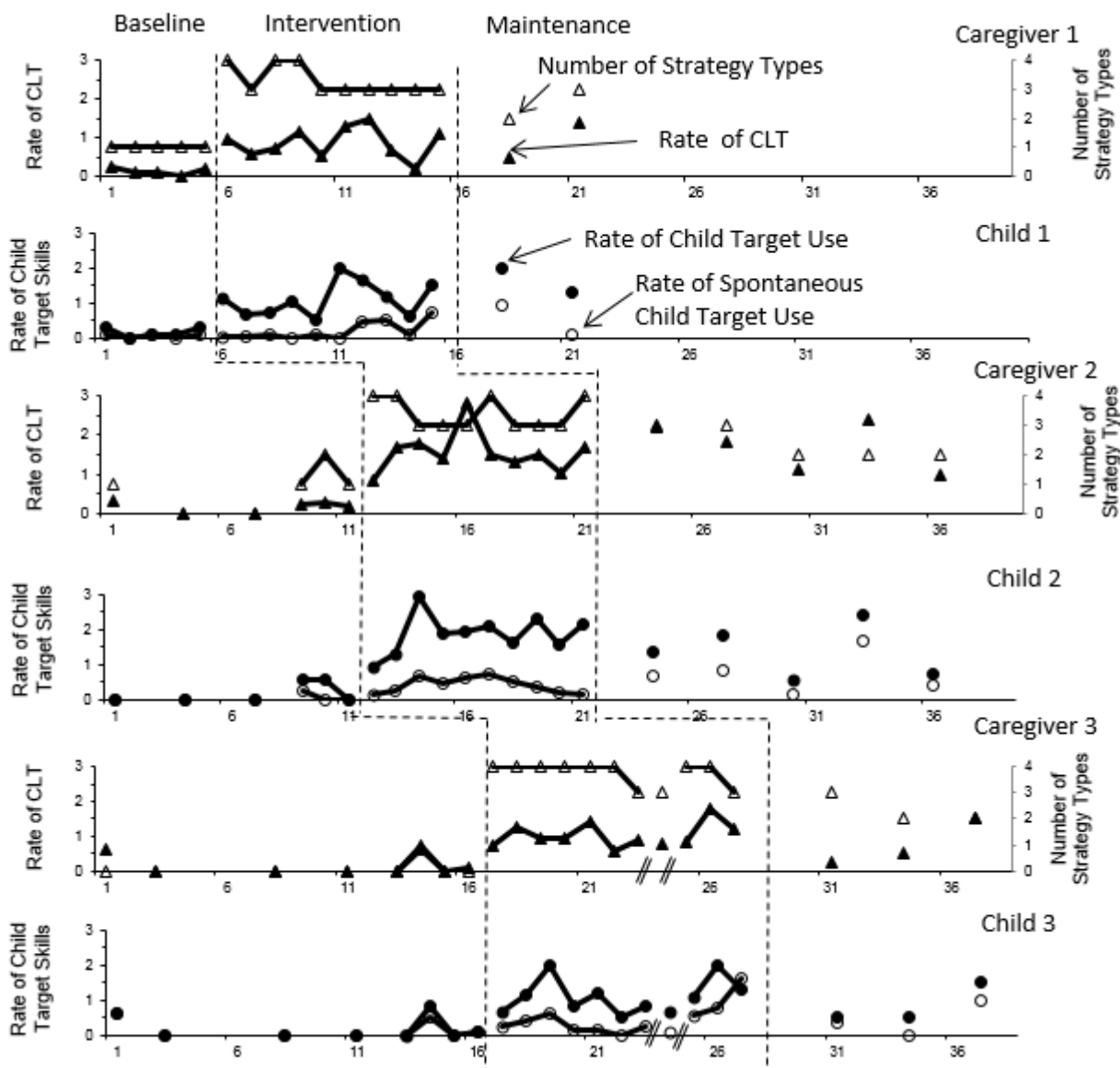


Figure 1. Multiple probe design across dyads. Caregivers' rate per minute of CLT (left axis) and number of strategies (right axis), and rate per minute of child total and spontaneous targets. Broken lines for Dyad 3 represent two breaks of 8 or more days.

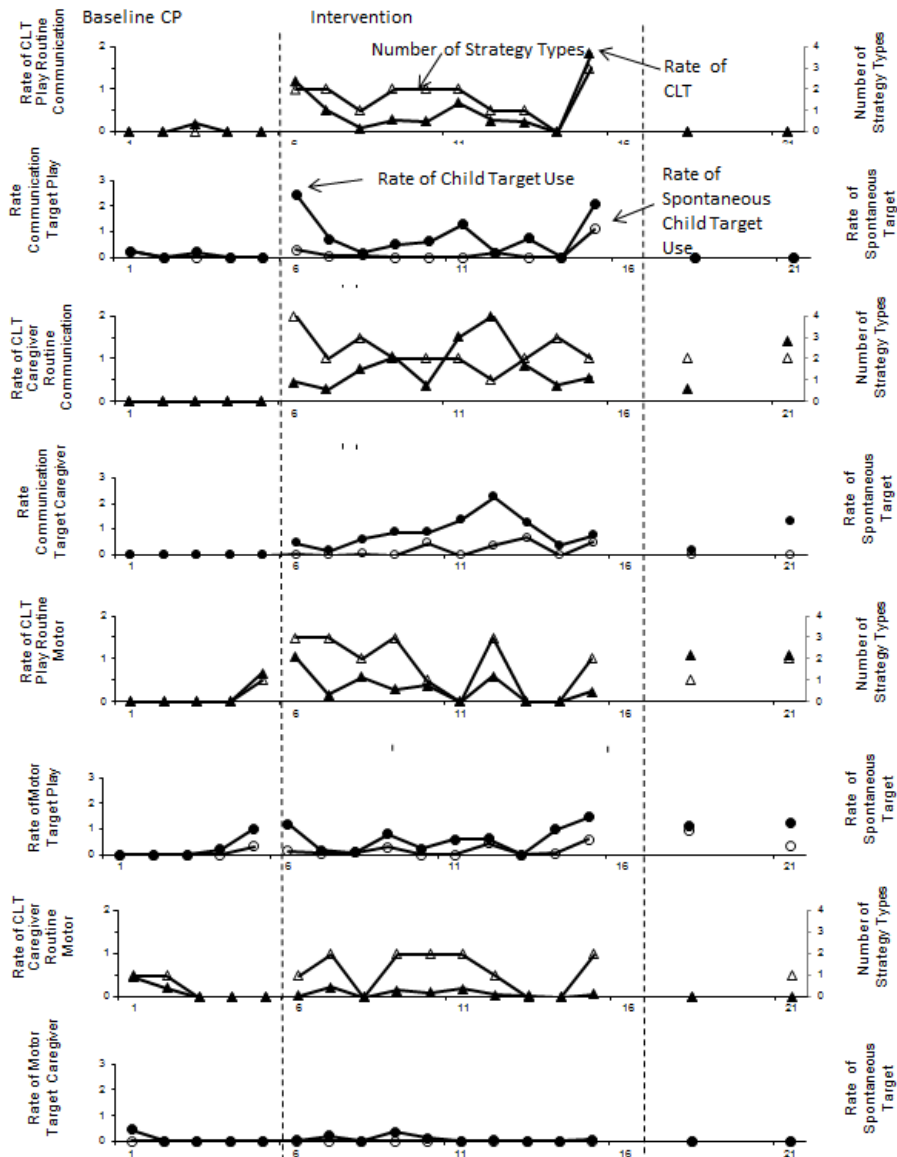


Figure 2. Dyad 1's Caregiver rate per minute of CLT and number of strategies and child rate per minute of total and spontaneous targets for communication and motor targets in play and caregiving routines.

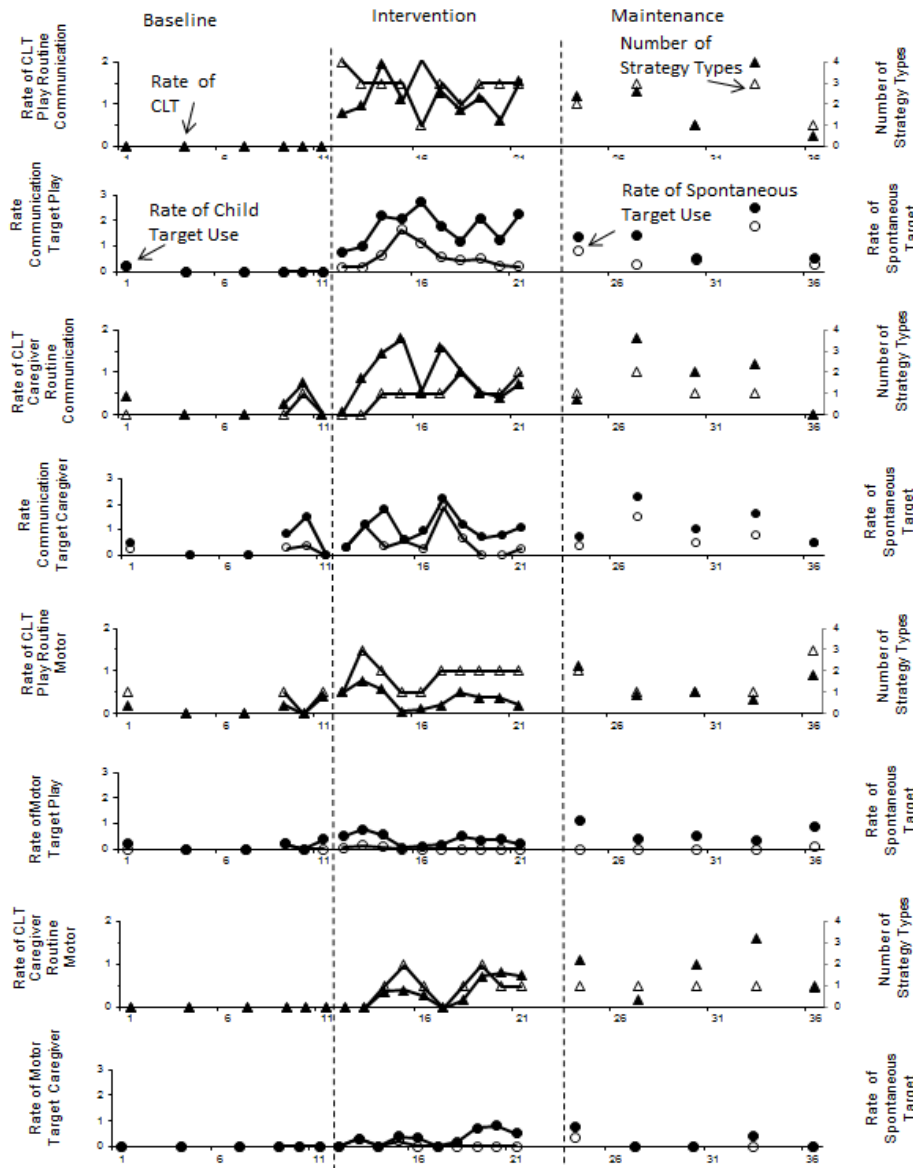


Figure 3. Dyad 2's Caregiver rate per minute of CLT and number of strategies and child rate per minute of total and spontaneous targets for communication and motor targets in play and caregiving routines.

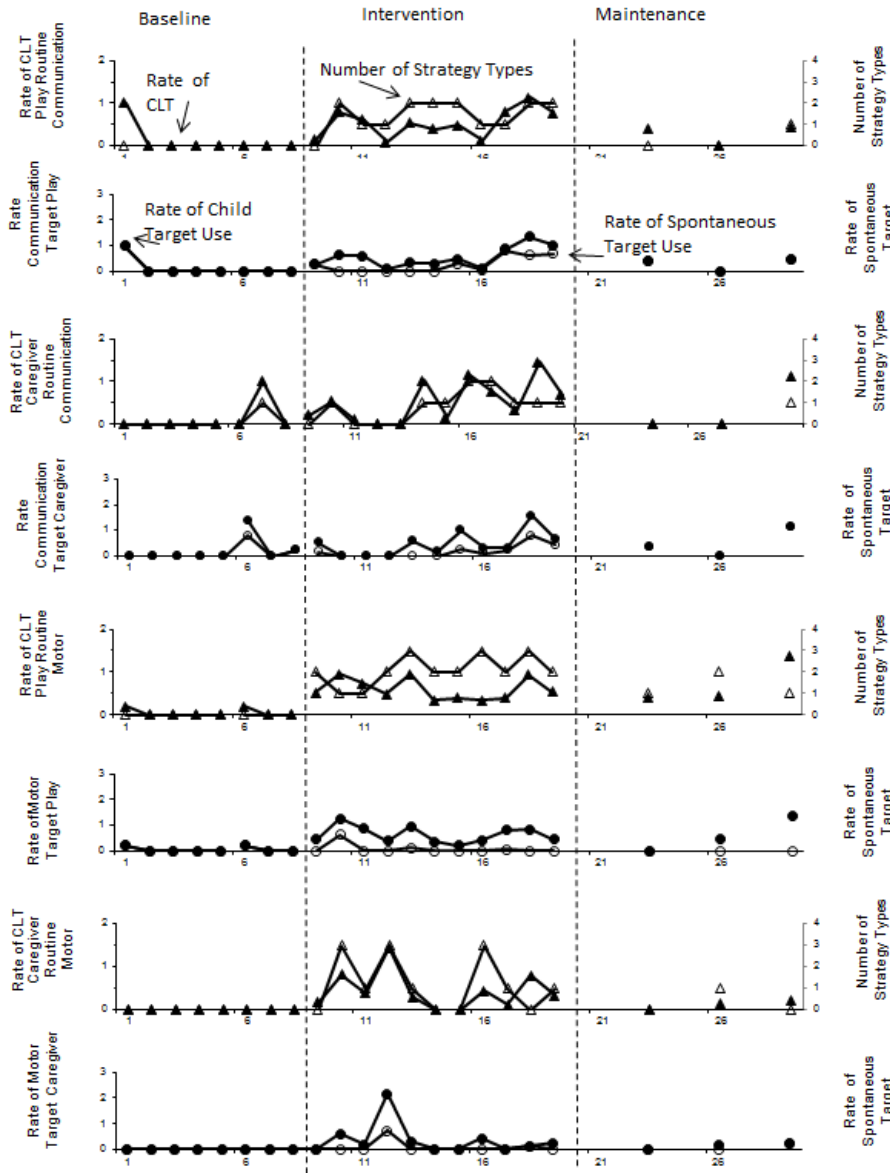


Figure 4. Dyad 3’s Caregiver rate per minute of CLT and number of strategies and child rate per minute of total and spontaneous targets for communication and motor targets in play and caregiving routines.

Appendix A

Visual Models for Planning During Sessions and for Planning Intervention Between Sessions

EPIC Embedded Practices and Intervention with Caregivers

Session Date: _____ Provider Name: _____ Child ID# _____

Today we will...

What:	How:	When/Where/Who:
Why: target - strategy - routine -		Is it working:

Provider Notes:

What:	How:	When/Where/Who:
Why: target - strategy - routine -		Is it working:

Caregiver Comments:

EPIC is a collaborative project between Florida State University, University of Florida, and University of Illinois-Chicago

EPIC

Embedded Practices and Intervention with Caregivers

Name: _____

This week we will...

What:	How:	When/Where/Who:
Why: target - strategy - routine -		Is it working:

EPIC is a collaborative project between Florida State University, University of Florida, and University of Illinois-Chicago

Appendix B Correct Learning Trial Coding Sheet

Correct and Complete Learning Trials, Strategy Types, Child Target Behaviors										
Date:	Session Type (b = baseline, I = intervention, m = maintenance) & Number:									
Correct: code 0 if not correct trial; 1 if correct. Correct doesn't require child target; requires correct adult behaviors.										
Complete: code 0 if not complete; 1 if complete. Complete includes child target and logical consequence										
Start Time:	Stop Time:	Minutes:								
Strategy Type: EA = Environmental Arrangement; CR = Contingent Responding; WT = Wait Time; P = Prompting										
Routine: C or P		Target: M or C								
Time	Target	Routine	Correct (0 or 1)	Complete (0 or 1)	Strategy Type	If incorrect, why?	A - antecedent	B- Did child perform behavior without extra help	C/EH- If child performed B, did adult give consequence? If no, did adult give extra help?	B2: child performs behavior with EH or hoh

Appendix C
How Strategies

How Strategies

1. Environmental Arrangement

Caregiver demonstrates one of the following environmental arrangement strategies

- Positioning (*e.g., caregiver moves to position him/herself so that he/she is facing the child or in a position that facilitates the child's movement and maintains joint interaction*)
- Arranging the materials (*e.g., caregiver places an obstacle between the child and the toys so that the child must go over and around to get to toy; adult places several attractive toys in the play area; adult shakes toy beside child to encourage child to turn head*)
- Assistance needed (*e.g., the caregiver gives child a snack within a baggy on purpose*)
- In sight but out of reach (*e.g., the caregiver places a preferred toy in the child's field of vision but out of reach so that the child must request; the caregiver places a preferred toy on a couch cushion so that the child may pull up; the caregiver places a ball slightly out of the child's reach to encourage scooting or crawling*)
- Small portions (*e.g., the caregiver hands the child 1/2 of a cracker to encourage the child to request more, provides 1-2 cheerios at a time to increase use of finger tips*)

2. Contingent Responding

Caregiver responds to the child using one of the following strategies

- Balanced turn-taking: The caregiver takes one verbal or nonverbal turn at a time during interactions with the child (*e.g., the caregiver waits for the child to take a verbal or nonverbal turn and then responds to the child; the caregiver comments, waits for the child's motor or communication act; the caregiver asks a question, the child responds, the caregiver responds back, etc.; the caregiver asks a question, the child does not respond for a minimum of 5 seconds, then the caregiver takes a second turn; the caregiver rolls the ball to the child and waits for him to roll it back*)
- Contingent imitation: Caregiver's verbal and/or nonverbal responses to the child's communication act (*e.g., the child says "bottle" and the caregiver says "bottle" afterward; the child points and the caregiver also points afterward; the child shakes a toy and the adult shakes a toy; the child waves at a departing family member, the adult waves*)
- Expansions: Caregiver repeats/responds to the child's utterance/gesture/sign by adding a word or modeling an expanded form of communication based on the child's utterance (*e.g., child reaches toward cheerios and says "uh", adult points and says cheerios; child shakes a block, adult shakes and stacks*)
- Modeling: Caregiver provides a model of the child's communication or motor target. (*e.g., the child looks toward the toy out of reach and the adult points or reaches and*

names the toy before getting it; the adult demonstrates putting two hands together to hold the bottle; the adult models clapping hands; the adult models stacking blocks or putting in)

3. Wait Time:

Caregiver pauses and looks expectantly at child, providing a nonverbal cue for the child to perform the target behavior (*e.g., caregiver stands up and looks down at child, waiting expectantly for child to gesture “up”; caregiver holds cup in front of child and waits for child to bring hands together to hold cup; caregiver holds up two items and waits for child to choose one*)

4. Prompting:

Caregiver uses intentional prompts following a sequence (least to most or most to least support) to encourage the child to engage in target behavior

- Least to Most Prompting Sequence

Communication: Open-ended question > Choice Prompt > Direct Prompt

(e.g., “What do you want?” waits for child “Car or barn” waits for child “Say _____”)

Motor: Task direction > Partial Support > Full support

(e.g., “Pull your pants up” waits “Pull your pants up-places child’s hands on waistband” waits “Pull your pants up-helps child pull”)

- Most to Least Prompting Sequence (*Graduated guidance falls into this category)

Full physical support > Partial physical support > Task directions

Appendix D Caregiver Diary

Caregiver Diary

As part of our research, we are interested in the amount and types of intervention your child receives throughout the week when we are not seeing him or her.

What early intervention services did your child have this week?

Type of Services	How many hours?	What goal did the provider and your child work on?
Occupational Therapy		
Speech Therapy		
Physical Therapy		
Home Visit from Early Intervention Provider		
Therapeutic Preschool		
Other		

For each day, please place a checkmark for any routines in which you used the "How" strategies, and indicate for how many minutes you used the strategies. Then, please place a checkmark for each "How" strategy you used and which target you taught using the strategy (motor, communication, or both).

	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday	
	Routine	Min	Routine	Min	Routine	Min	Routine	Min	Routine	Min	Routine	Min	Routine	Min
Meals/Snacks														
Play														
Chores														
Dressing														
Hygiene														
Books														
Which "how" strategies did you use and for which target?														
	"How"	Targ.	"How"	Targ.	"How"	Targ.	"How"	Targ.	"How"	Targ.	"How"	Targ.	"How"	Targ.
Environmental Arrangement														
Contingent Responding														
Wait Time														
Prompting														

Appendix E

Caregiver Feedback Survey

Date completed (mm/dd/yyyy): _____ Family/Child: _____ Site: _____

Thank you for agreeing to participate in the Embedded Practices and Intervention with Caregivers (EPIC) Project. Family input is essential to this project and the information you share will be used to revise the process for future studies. Please complete this survey before you participate in your interview. We will use your answers to help guide our discussion.

Everyday Routines and Activities	Very useful	Somewhat useful	Not very useful	Not at all useful
1. The EPIC approach uses everyday routines and activities, and the family's own toys and materials, for teaching and learning. To what extent do you think this is a useful approach?				
Coaching	Very useful	Somewhat useful	Not very useful	Not at all useful
2. Rather than working directly with your child, the EPIC approach uses coaching as a primary means of working with you. To what extent do you think coaching was useful to support your learning of how to teach your child?				
What coaching strategies did your provider do that helped you learn? (check all that apply)				
<input type="checkbox"/> Share specific information about intervention strategies/ child development				
<input type="checkbox"/> Demonstrate and explain intervention strategies				
<input type="checkbox"/> Make suggestions about things to try				
<input type="checkbox"/> Practice with you				
<input type="checkbox"/> Give you opportunities to practice				
<input type="checkbox"/> Ask questions				
<input type="checkbox"/> Answer your questions				
<input type="checkbox"/> Problem solve with you				
<input type="checkbox"/> Share handouts/materials				
<input type="checkbox"/> Other (please describe) _____				
5Q	Very useful	Somewhat useful	Not very useful	Not at all useful
3. You and your provider discussed 5 questions in relation to embedding learning opportunities for your child in family routines (Why? What? Where/When/Who? How? and Is it working?). To what extent did you find the 5 questions are useful in learning the steps for how to embed learning targets in everyday routines?				
4. To what extent was the 5Q visual model useful in actually teaching your child motor and communication skills between home visits?				

EPIC Approach	Very useful	Somewhat useful	Not very useful	Not at all useful
5. The EPIC approach starts off with frequent home visits for 1 to 2 weeks, and then reduces the number of visits as caregivers learn the 5Q process. This is called “front loading” coaching with caregivers. To what extent did you find this “front loaded” process useful in first learning how to work with your child?				
6. The EPIC approach asks EI providers to follow a general, but flexible, sequence during home visits. To what extent was the flow of the home visit useful in helping you identify and use naturally occurring learning opportunities as teachable moments with your child?				
Using Intervention Strategies	Never	Sometimes but not everyday	Everyday	Multiple times during the day
7. Outside of EPIC home visits, how often did you use intervention strategies in the routines you identified and practiced with your EPIC provider?				
8. How often did you use intervention strategies in OTHER routines or activities with your child?				
Self Efficacy	A great deal	Somewhat	Not	Not at all
9. To what extent do you think the EPIC approach helped you take a more active role in your child’s learning?				
10. To what extent do you agree with the following statement? “Now that I know how to use 5Q, I feel more confident and able to teach my child essential skills”.				

Other comments you would like to share:

**Appendix F
Provider Coaching Fidelity**

S-O-O-P-R Coaching Observable Practices

Provider:

Session Date:

Rater:

Rating Date:

Use this checklist to document use of the S-O-O-P-R components in video recorded home visits. These indicators are observable practices that you may see in home visit sessions. Check “Yes” for each of the practices observed, note the time interval, and write a brief description of the practice (e.g., *Provider asked mom what she thought went well during hand washing*). Check “No” if the practice was not observed during the video.

Motor target:

Communication target:

Observable Coaching Practice	Yes	Video Time	Description of Observed Practice in Video	No
Setting the Stage				
1. Provider gathers status update with caregiver about child or family (e.g. recent activities, progress, health).				
2. Provider discusses with caregiver what happened with intervention implementation since last visit using or discussing the visual model. (N/A for first visit)				
3. Provider and caregiver review how specific child targets, strategies, or routines/activities connect to larger goals or IFSP outcomes.				
4. Provider and caregiver agree on family priorities and plan for the visit, including what, how (EMT strategies), and activity or routine.				
Observation				

5. Provider observes caregiver and child interaction during at least one routine or activity before initiating specific coaching strategies for teaching child targets or coaching caregiver on “how” strategies.				
Opportunities for Embedding Intervention				
6. Provider uses the specific coaching strategies 3-5 times in at least 2 routines or activities to support caregiver's interactions with or teaching of the child.				
Indicators:				
6a. Direct teaching. Provider shares specific information about an intervention strategy, child development, or a routine/activity with the caregiver.				
6b. Demonstration with narration. Provider demonstrates how to teach for caregiver by interacting with the child and commenting about the teaching strategies being used.				
6c. Guided practice with caregiver. Provider either is engaged with the caregiver or child or sitting closely with the dyad <u>and</u> provides specific suggestions or directions to the caregiver on the target, strategy use, or routine/activity.				
6d. Caregiver practice. Provider observes caregiver implementing at least one teaching strategy with child on the identified learning target.				
7. Provider gives specific feedback immediately (within 30 seconds) after each occurrence of guided practice or caregiver practice (?) (CG) interaction or teaching with child (C).				
8. Provider gives general feedback at least three times throughout session (e.g., good job! Beautiful!)				
Reflection and Problem Solving				
9. Provider supports parent to reflect on the activity the session to identify what worked and if additional supports or adjustments might be needed.				
10. Either provider <u>or</u> caregiver initiates an exchange of ideas or information relevant to the activity/routine, the target addressed, or the intervention strategy for at least 2 turns to clarify, expand, or revise the current approach.				

11. Provider and parent discuss options or agree on what to do when, how, and how often in current or future routine or activity to teach or support the identified child targets.				
Review				
12. Provider and caregiver identify strategies parent can use between current and next planned visit to document child progress (Is it working?) (e.g., number of steps taken, which words used in context duration, frequency, or type of behavior observed).				

Appendix G

Identifying Family Routines and Activities and Summary Routine and Target Information

EPIC Embedded Practices and Intervention with Caregivers

Child: _____ Date: _____

Identifying Family Routines and Activities

Conversation Starters

Consider using some of these comments or questions to open a dialog about the child's and family's activities, environments, and routines.

1. We'd like to learn about the priorities you have for your child's motor (moving) and communication skills and some of the everyday routines and activities in which he or she uses motor and communication skills. By sharing your and your child's daily activities and routines, you are helping to identify potential times and places for you teaching and your child learning priority motor and communication skills.

2. What are your priorities for _____'s communication?

3. What are your priorities for _____'s motor development?

4. What specific communication and motor target skills would you like _____ to develop as a focus of these visits?

Communication: _____

Motor: _____

5. Tell me about your day.

█

6. What are the routines/activities that happen the most for you and _____? What do you do on most Mornings? Afternoons? Nights? Weekends?

7. What routines/activities does _____ enjoy doing?

- a. What makes this routine(s) enjoyable to _____?

- b. What does _____ usually do during the routine/activity?

- c. What do you (or the other care providers) do during the routine/activity?

- d. How long does it take?

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8. If the caregiver is having difficulty identifying activities or routines, ask some specific questions about some of the following: dressing, breakfast, watching TV, car travel, preparing meals, household chores, nap, lunch and evening meals, yard work, bath, bedtime stories, or hanging out.

9. What routine/activity(s) does _____ dislike?
 - a. What makes this routine/activity difficult or uncomfortable for _____?

- b. What does _____ usually do during the routine/activity?

10. What are your expectations for _____'s participation during the routine/activity?

- a. What do you do during the routine/activity?

- b. How do you let _____ know what is to be expected in this routine/activity?

11. What are the best times for you and your child during the day? Which routines/activities might be the best fit for and most comfortable for teaching your child motor and communications skills?

Possible follow-up questions to consider after criteria are met on regular preferred routines:

12. Are there any activities or places that you go (e.g., shopping, doctor's appointments) that occur on a less than regular basis (e.g., once a week, every few days)?

13. Are there other events that occur fairly regularly or during the weekend (e.g., sport events for siblings)?

Adapted from TACTICS, tactics.fsu.edu

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EPIC Embedded Practices and Intervention with Caregivers

Summary Information

Communication Target: _____ Motor Target: _____

Good Times & Places: _____

Routine or Activity	What Caregiver Does	What ____ Does	What motor or communication skills could be priorities for teaching in routine/activity?