Examining the Use of Virtual Training and Coaching on Practitioners' Implementation of A Triadic Approach in Early Intervention: A Mixed Methods Investigation

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Abstract

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Capacity-building family-centered practices are a fundamental component of Early Intervention (EI) service delivery, yet their adoption by EI practitioners remains inconsistent. Lack of sufficient practitioner training and overly broad recommended practices for practitioners are cited as potential barriers to their implementation. The triadic strategies presented in the (Parents Interacting With Infants) PIWI framework outline a set of practitioner behaviors that aim to support caregiver capacity through the facilitation of positive caregiver-child interactions in the context of developmental-enhancing activities. However, little is known about the effects of the triadic strategies on caregiver-child interactions when delivered via teleintervention. Also, professional development opportunities need to be explored for improving practitioners' use of these strategies. This mixed methods study used a single-case research design to examine the

efficacy of a virtual training and coaching intervention in increasing practitioners' use of triadic strategies with caregivers and their young children during teleintervention services. Additionally, we used qualitative interviews to understand the experiences and perspectives of EI practitioners and families regarding a triadic, family-centered approach to virtual service delivery. Results suggest modest, but consistent, increases in practitioner use of strategies with training and coaching. Participants shared positive experiences with the intervention and implementation of strategies, along with factors influencing strategy use. Implications for practice and research are discussed. This study contributes to the field's understanding of how virtual training and coaching opportunities might support practitioner use of capacity-building, family-centered practices needed to promote positive family outcomes in EI.

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CHAPTER 1

Early childhood is a time of profound growth and development for young children, shaped within the context of foundational family relationships (Bronfenbrenner, 1979; Guralnick, 1997). The interactions that children experience with caregivers in these first relationships guide and support children's learning and development in multiple domains. The early learning literature suggests that supports targeting children's development is most effective when initiated early in life and when actively involving the child's family members (Phillips & Shonkoff, 2000). Notably, Part C of the Individuals with Disabilities Education Act (IDEA), recognized the significance of family influences on the child's development by responding to an "urgent and substantial need...to enhance the capacity of families to meet the special needs of their infants and toddlers with disabilities" (Education of All Handicapped Children Act, 1986, 1431(a)(4)) with the provision of early intervention services.

Early intervention (EI) describes federal grant funding offered under Part C of IDEA to assist states with providing medical, educational, and therapeutic services to support families and their young children under the age of three with disabilities (Bruder, 2010). Among its primary goals is a commitment to strengthen the family's capacity to support their child's growth and development (Friedman et al., 2012) through the delivery of family-centered care. As one of the first professionals the family encounters in their child's developmental support team, EI practitioners are in a unique position to help caregivers meet the needs of their child's growth and development. However, most families of young children in EI receive two hours a week of service or less with their practitioners, with a small percentage receiving less than 30 minutes

each week (McWilliam, 2012; NIELS, 2007). Therefore, it is essential that practitioners use the most effective strategies available to create the greatest possible impact on child and family outcomes in the limited service hours available with children and their families. Considering the impressionable young age of children served in EI and the relatively few hours that practitioners spend with them, parents, caregivers, and other family members are an integral element in service delivery for children with disabilities in this age group (Guralnick, 1997; Kaiser & Hancock, 2003). Ensuring that practitioners have sufficient training to assist families with improving targeted family and child outcomes is essential, especially considering the current need for virtual professional development opportunities for professionals as well as teleintervention service delivery for families.

Service Delivery in EI

Family-centered practice is fundamental to the field of EI and is considered to be both a guiding framework for family care and a set of guidelines describing ideal practitioner behavior in EI service delivery (Bruder, 2000; Dunst et al., 1991). When engaged in family-centered practice, professionals are called to “view families as equal partners. Intervention is individualized, flexible, and responsive to the family-identified needs of each child and family," (Espe-Sherwindt, 2008, p. 137). In this approach, the practitioner focuses on incorporating intervention practices that highlight the family’s unique needs and strengths as determined by that family. Practitioners position the caregiver and child at the center of the intervention relationship, providing support as needed to help promote the caregiver’s capacity and sense of competence in their ability to support their child’s development. By tailoring the intervention to family-identified needs and strengths while centering family relationships, EI practitioners are more likely to promote high-quality caregiver-child interactions, while embedding intervention

in relevant daily family routines and activities that promote the child's participation and improve family functioning (Bruder, 2000; McWilliam, 2010; Sawyer & Campbell, 2009). Research shows that children make greater progress when caregivers are highly engaged in carrying out intervention activities with children than when practitioners take up that role with children, even when practitioners make such attempts over repeated visits (Dunst et al., 2001; Kasari, et al., 2001). Therefore, the most efficient and effective use of service delivery hours in EI involves practitioners engaging caregivers and children in triadic interactions, which favor the use of caregiver coaching practices aimed at centering the caregiver-child dyadic relationships, not attempts by the practitioner to teach the child directly (McCollum et al., 2001).

Despite over thirty years of recommendations for providing family-centered practice, its implementation in EI is still uncertain and inconsistent, with many practitioners continuing to use child-centered models when interacting with the children and families they serve (Hebbeler & Gerlach-Downie, 2002; McBride & Peterson, 2007; Peterson et al., 2007). One reason for this may be a lack of clear strategies for EI practitioners to draw from that support high-quality caregiver-child interactions. By not involving the caregivers directly, interventionists fail to provide opportunities for caregivers' direct participation. In turn, this lack of direct caregiver involvement denies caregivers with essential opportunities to develop a sense of competence in their role, support their child's development, and learn the skills needed for implementing their child's intervention between practitioner visits. As a result, both the children and their caregivers are disadvantaged. While some attribute this tendency towards child-directed services to practitioners' beliefs about family-centered practice (Sawyer & Campbell, 2009), broad implementation guidelines (Ozdemir, 2007), and inadequate preservice training (Bruder, 2010; Dunst et al., 2014; Dunst et al., 2019), there is not yet consensus in the field regarding how

practitioners make sense of their role and their relationship with families. Additional research is needed to investigate the barriers EI practitioners experience with implementing recommended practices in their work with families as well as how the field of EI can support practitioners with overcoming them. One option involves making significant improvements to the professional development training available for EI practitioners.

The Need for Training in EI

Research suggests that improvements to professional development opportunities are needed to support EI practitioners with implementing recommended practices. Many preservice training programs do not adequately prepare interventionists to engage families in early intervention and practitioner reports support this notion that they feel unprepared, despite having college-level training (Bruder 2010; Dunst et al., 2014). Practitioners also express feeling under-trained in essential family-centered, relationship-based interventions (Banerjee & Luckner, 2014; Bruder et al., 2013; McBride & Peterson, 1997), which include coaching caregivers to engage in high-quality interactions with their young children. These claims point to a clear barrier to the delivery of recommended practices in EI. EI practitioners are in need of professional development training that enables them to implement family-centered, triadic approaches with the children and families they serve (Romano, 2020). For professional development opportunities to be maximally effective, research suggests that pairing training with ongoing coaching supports adult learning and improves practitioner uptake of learned skills (Fixsen et al., 2005). With its inclusion of planning, practice, reflection, and feedback cycles, coaching can help practitioners improve skill acquisition, professional confidence, and relationship-building (Trivette et al., 2009).

In light of our current global pandemic, many professional development programs across the country must be delivered virtually to maintain the health and safety of their communities. Fortunately, early research shows that professional development training and coaching components may effectively support practitioner learning when conducted remotely (Krick Oborn & Johnson, 2015; Meadan et al., 2020). Additionally, virtual professional development may provide practitioners with opportunities to access training and coaching in evidence-based practices not available to them locally (Bullock et al., 2008). At this time, research investigating virtual professional development in EI is limited. Further exploration into its feasibility and effectiveness in delivering training and coaching in triadic, family-centered practices for the purpose of promoting child and family outcomes could inform the field as we navigate this pandemic.

Triadic Strategies in EI

The triadic strategies as presented within the Parents Interacting With Infants (PIWI) framework (McCollum et al., 2001; McCollum & Yates, 1994) comprise a set of six strategies describing practitioner behaviors that align with family-centered caregiver coaching practices. The primary aim of the PIWI model is to improve caregiver-child interactions during the course of family play routines and activities. Using these strategies, EI practitioners implement family-centered help-giving practices to bolster caregivers' sense of competence and confidence (Dunst & Espe-Sherwindt, 2016; McCollum et al., 2001). Their emphasis on strengthening the dyadic relationship to promote child and family outcomes is consistent with DEC recommended practices (Division for Early Childhood, 2014) and research supporting evidence-based practice in EI (Popp & Wilcox, 2012; Trivette et al., 2010). Similar approaches embracing a triadic approach to intervention relationships, such as family-guided routines-based intervention

(FGRIB: Woods, Kashinath, & Goldstein, 2004), show promise in promoting development-enhancing caregiver-child interactions and child learning outcomes. However, definitions of interactions in various approaches, such as FGRBI, differ to some degree from PIWI strategies and may not consistently require a caregiver-child interaction context for them to be considered triadic. While the principles supporting triadic strategies from the PIWI framework share characteristics with evidence-based EI practices, there is very limited research validating their use in the field.

Also, specific strategies need to be paired with recommended practices (DEC, 2014b) in EI to guide practitioners in knowing how to apply family-centered approaches to their work with young children and families. Current conceptualizations of recommended practice may not be tangible enough to promote meaningful change. In his summary of why practitioners continue to align with child-centered service, Ozdemir (2007) suggests practitioners lack clear guidance from the field regarding how to implement family-centered practices. The PIWI triadic strategies have the potential to provide practitioners with outlined evidence-informed behaviors promoting just that. Further investigations into the feasibility of these strategies in providing practitioners with clear guidelines for an effective set of comprehensive coaching behaviors that promote family-centered care are warranted.

Teleintervention in EI

The question of how practitioners deliver EI services is also a significant consideration. Currently, many families find themselves initiating or continuing services during the COVID-19 pandemic, with in-person visits not offered by local EI agencies. Virtual service delivery, also referred to as telehealth or teleintevention, describes services delivered using computer technology, such as video conferencing platforms (Poole et al., 2020). In recent years,

teleintervention has been widely adopted by EI practitioners of various disciplines as a solution to providing services to families and young children at a distance (Ashburner et al., 2016). While this may now be a new form of service delivery for many communities, teleintervention is a familiar arrangement for families already living in more remote areas, who don't have local access to services. In addition to increasing access to EI services for rural or remote families, research shows that teleintervention can lower costs for professionals and reduce direct-to-child services. By reducing travel time between visits and eliminating transportation costs, practitioners' time management is supported and time saved can be devoted to service delivery (Kelso et al., 2009; Kyzar, 2014; Meadan, 2020).

Furthermore, EI services provided via teleintervention potentially increase triadic interactions among practitioners, caregivers, and children, thereby decreasing the likelihood of practitioners working directly with the child during sessions (Ashburner et al., 2016; Behl et al., 2017; Kelso et al., 2009). Furthermore, family-centered service components, such as engaging with the family in their natural learning environment with materials found in their home, are emphasized (Dunst et al., 2014; Williams & Ostrosky, 2020; Workgroup on Principles and Practices in Natural Environments, OSEP TA Community of Practice: Part C Settings, 2008). These factors could prove beneficial for agencies, practitioners, families, and young children in EI, compelling the field to continue using teleintervention to augment or replace in-person service delivery post-COVID. However, the current available research does not yet demonstrate teleintervention's capacity for supporting the implementation of family-centered triadic strategies. Considering the potential significance of teleintervention to the future of EI service, more needs to be known about how it is linked to recommended practice in the field.

Purpose of Study

Taking into account these various factors concerning the importance of triadic, family-centered practices in EI for ensuring family and child outcomes (Dunst et al., 2001; Sawyer & Campbell, 2009), the prevalence of direct-to-child service (Hebbeler & Gerlach-Downie, 2002), the potential benefits to service delivery via teleintervention (Kelso et al., 2009), the need for improved virtual professional development opportunities in supporting EI practitioners to make these shifts in service delivery (Bruder et al., 2013; Dunst et al., 2014), and the promise of triadic approaches in guiding practitioners to facilitate high-quality caregiver-child interactions (Woods et al., 2011), the purpose of this study is twofold. Firsthis mixed methods research project aims to investigate the feasibility of a virtual training and coaching program for EI practitioners in increasing their use of triadic strategies with caregivers during teleintervention services. Additionally, this study seeks to understand the experiences of both EI practitioners and families during implementation of family-centered virtual service delivery. We believe that gathering information from professionals and consumers about the benefits and barriers to teleintervention will inform the field regarding how best to provide effective service delivery on a long-term basis. In light of the current global pandemic and the general uncertainty regarding when in-person services will be deemed safe again by communities across the country, it is necessary for the field to explore alternate modes of service delivery that align with recommended practice in EI. In addition, considering the documented benefits related to decreasing costs and increasing access for rural and remote families, it is worth considering if virtual intervention services could augment or implement ongoing service delivery post-COVID. As such, the research questions for this project are as follows:

1. To what extent is there a functional relation between virtual professional training and coaching opportunities and EI service practitioners' use of triadic parent coaching strategies?
2. To what extent does practitioners' implementation of triadic strategies affect dyadic interactions?
3. What are practitioner experiences with virtual professional development training and coaching in a triadic, family-centered approach to service delivery?
4. What are practitioner and family experiences with a triadic approach to EI service delivery in a teleintervention setting?
5. What factors influence the implementation of triadic strategies during EI teleintervention service delivery?

CHAPTER 2

Review of the Literature

The following literature review conducts an in-depth exploration of several key concepts essential to the implementation of triadic, family-centered approaches to virtual service delivery in EI. After a discussion of the foundations of family-centered practice and its theoretical underpinnings, further consideration will be given to triadic approaches in EI, as well as issues concerning training and implementation of recommended practices. Research into virtual service delivery and professional development opportunities will also be addressed.

Family-Centered Practice in EI

Family-centered practice describes the essential qualities of a positive family-professional relationship in early childhood special education and is a primary driver in promoting high-quality family-practitioner and caregiver-child interactions in the field (Bruder, 2000; Dunst & Trivette, 2009; Dunst et al., 2002; Dunst et al., 1991; Espe-Sherwindt, 2008). Its primary characteristics are regarded as essential components to effective family practice and partnership by investigators (Bruder, 2010: Dunst et al., 2001) and professional organizations supporting EI (DEC, 2014; National Association for the Education of Young Children/NAEYC, 2011). In addition, the provision of supports and resources for families is expected to provide caregivers the knowledge and skills necessary to engage their children in development-enhancing learning opportunities (Bronfenbrenner, 1979). Ideally, this approach to care begins when the family is introduced to EI and continues through Individualized Family Service Plan (IFSP) outcome development, service delivery in home, community, and center environments, and the beginning phases of the transition process, before special education services are transferred to Part B when the child turns three years old.

Guiding Theories in EI

Family-centered practice was first used to describe an approach to service delivery in the 1960s (Wiedenback, 1967) and was primarily conceptualized from an ecological social-systems model (Brofenbrenner, 1979). Bronfenbrenner (1979) recognized the significant influence of daily environments, such as interactions with the family, on the child's development. This influence extends beyond the home to include extended family relationships, community connections, and programs and policies that affect positive family functioning and child development. Since then, it has continued to evolve, including key interwoven elements from multiple theories focused broadly on strengthening family functioning to support child development, such as capacity-building (Dunst et al., 2019; Dunst & Trivette, 2009; DEC, 2014), help-giving (Brickman et al., 1982; Dunst et al., 2002; Dunst & Espe-Scherwindt, 2016), self-efficacy (Bandura, 1995; Bandura, 1977), and empowerment (Rappaport, 1981) models. While researchers have developed theories of how these various components of family-centered practice interact to promote positive child and family outcomes, there is not yet a definitive model. Instead, these various paradigms dynamically contribute to the ideal picture of service delivery in EI: one that values practitioner-family relationship building and caregiver competency-enhancing practices for the purpose of improving child and family outcomes via high-quality caregiver-child interactions.

Based on the four models of helping and coping described by Brickman et al. (1982), Dunst and colleagues (2002) describe and examine key relational and participatory *helpgiving* practices, geared towards supporting and strengthening caregiver competence. Relational helpgiving occurs when practitioners include active and reflective listening, warmth, trustworthiness, and empathy in their work with families, and reflects the relationship-building

dimension of family-centeredness (Dunst & Espe-Sherwindt, 2016). Alternatively, participatory helpgiving emphasizes practitioner support of actions taken by caregivers to promote positive gains in their child's development. Such participatory helpgiving actions are competence enhancing (Dunst & Espe-Sherwindt, 2016) and include problem solving, decision-making, actively participating in gathering knowledge and skills, and implementing necessary actions to support their chosen outcomes. Notably, this also includes the need for families to identify and mobilize their own formal and informal supports. Similarly, Dunst and Trivette (2009) include these two helpgiving strategies into their *capacity-building paradigm*, which emphasizes the strengths and assets of families and young children with disabilities, as well as the multiple resources and supports available to the family to help them acquire needed skills to support desired outcomes.

Central to family-centered practice are the notions of empowerment and self-efficacy for families of young children with disabilities. In contrast to prevention models, Rappaport (2002) makes a case for empowerment as an essential experience in an individual's life, and for which "helpers" are called to "enhance the possibilities for people to control their own lives" (p. 15). Empowerment models recognize the family's ability to determine their own needs, find unique solutions to their problems, and access a variety of resources and opportunities for support and development. As it applies to family-centered practice, family members are seen, and treated, as fully capable of making informed choices and decisions on behalf of their children and taking the necessary actions to support their child's development (Dunst et al., 2002). Family members perceive that positive outcomes are a result of their own efforts. Supporting the development of self-efficacy beliefs (Bandura, 1977; Bandura, 1995) for caregivers is another aim in family-centered practice (DEC, 2014) related to strengthening caregiver capacities. As family members

enhance their sense of efficacy in their parenting role, they increase their belief in their own capabilities to face challenges, exercise control over the events in their (and their child's) life, and recover from stress. Such resiliency is essential in the parenting role and is a priority in EI family outcomes.

Traditional Models of Service Delivery in EI

Family-centered practice evolved from earlier, more traditional professional-centered models of service delivery (Dunst & Trivette, 2009; Dunst et al., 1991), in which early childhood special education practitioners center their work almost exclusively on the skills of the child with little to no involvement of the primary caregiver present (Dunst et al., 2019; McBride & Peterson, 1997; Peterson et al., 2007). In professional-centered work, also referred to as *child-centered, child-focused,* or *direct-to-child services*, practitioners may work directly with the child, with caregivers watching practitioners deliver intervention and listening to practitioners describe what they are doing with the child. In some cases, caregivers may not be present during intervention. In this approach, the EI practitioner assumes the role of expert in the child's development, oftentimes adopting a deficit view of the family (Dunst et al., 1991). In contrast to the ideals held by family-centered practice as described above, professional-centered models perceive families as incapable of solving their own problems and needing the assistance of practitioners to support their child's development.

Based on investigations of EI home visits, these service models persist (Campbell & Sawyer, 2009; Hebbeler & Gerlach-Downie, 2002; McBride & Peterson, 1997; Peterson et al., 2007), with practitioners continuing to deliver professional-centered services in the field instead of adopting family-centered approaches to EI. This has been observed internationally as well (Dalmau et al., 2017). In their qualitative study investigating implementation of the Parents as

Teachers (PAT) program, Hebbeler and Gerlach-Downie (2002) conducted interviews and focus groups with both caregivers of young children and home visitors about their experiences with home visiting during the first three years of the child's life. Home visitors were found to focus on changes in children's behaviors when talking with parents but de-emphasized how parents' behavior, such as during parent-child interactions, could affect their child's development. Additionally, home visitors thought they were modeling adult-child interactions for parents when working directly with the child but did not communicate to parents what to do with what they were observing. As a result, parents did not recognize the home visitors' activities as modeling and instead assumed these practitioner-child interactions were intended to teach skills to the child directly. As illustrated in this study, traditional professional-centered models often overlook the significance of active caregiver involvement and caregiver-child interactions during sessions, resulting in an overall lack of support for caregiver competence in understanding and implementing developmental activities intended to support their child's progress toward outcomes.

In contrast to these findings, Cambray-Engstrom and Salisbury (2010) conducted a case study of practitioner collaboration practices during EI home visits with ten Latina mothers. Unlike previously mentioned studies, they did not find that practitioners engaged in child-focused intervention for the majority of home visits when caregivers were more engaged and interactive. Notably, child-focused strategies were used on average 22% of intervals across home visits where caregivers were less engaged during sessions and only 4% when they were more engaged. Instead, practitioners were more likely to use *joint interaction* or *conversation/information sharing*, practices which involve practitioners working with the child in partnership with the caregiver and talking with the caregiver about questions or issues related

to the child or the intervention. The authors considered the findings from this specific group of practitioners to be related, in part, to the consistent training and implementation support they received through their EI program. The issue of adequate training for EI practitioners in delivering family-centered practice with a triadic orientation is significant to the research questions for this study and will be addressed later in this literature review.

Triadic Approaches in EI

High-quality caregiver-child interactions are a key focus of family-centered EI services and support positive child and family outcomes. Consistent with the aims of family-centered practice (Bruder, 2000; Dunst et al., 1991; Espe-Scherwindt, 2008) in Part C, triadic strategies can be implemented by EI practitioners to facilitate caregiver-child interactions that are pleasurable and engaging for both members of the dyad (McCollum et al., 2001). Triadic strategies support caregivers with engaging in developmentally enhancing interactions with their children via capacity-building and competency-enhancing practices (Dunst et al., 2019; Dunst & Trivette, 2009), while strengthening family functioning (Espe-Sherwindt, 2008). These strategies are included as an integral part of the PIWI framework (McCollum et al., 2001; McCollum & Yates, 1994), developed over thirty years ago by interdisciplinary faculty at the University of Illinois at Urbana-Champaign. PIWI is a relationship-based EI service delivery model originally developed to provide a practicum experience in which young children and their caregivers participated in weekly playgroups. Caregiver-child interactions are a focus of intervention activities. Unlike traditional, professional-centered approaches to care, the triadic strategies consist of specific practitioner behaviors which strengthen the caregiver-child relationship, reflecting the theoretical and research foundations of the PIWI philosophy: caregiver-child interactions (National Scientific Council on the Developing Child, 2004a), family-centered

practice (e.g. Dunst et al, 2002), and ecological systems theory (Bronfenbrenner, 1979). The triadic strategies as described by the PIWI model share overlapping characteristics with several other approaches to EI and early childhood special education service delivery based on recommended practice, including the participation-based approach (Campbell & Sawyer, 2009), routines-based intervention (McWilliam, 2012), family-guided routines-based intervention (Woods, Kashinath, & Goldstein, 2004), and natural learning opportunities (Dunst et al., 2001). For instance, in a participation-based approach, the focus is on promoting the child's participation within common family activities and routines. The caregiver and child lead the activity, the caregiver directly interacts with the child, and the interventionist helps to facilitate their interactions (Campbell & Sawyer, 2007). Similar to the triadic strategies, each of these approaches emphasizes the quality and context of the caregiver-child relationship, with the practitioner supporting family functioning (McCollum & Yates, 1994).

A more complete understanding of the triadic strategies from the PIWI framework necessitates a description of dyadic interactions, the practitioner's role in supporting caregiver-child interactions, definitions of the six distinct strategies, key components of the intervention relationship that complement implementation of the triadic strategies, and a brief review of the literature supporting use of triadic strategies.

Dyadic Interactions

The caregiver-child relationship, also referred to as the *dyad* (McCollum & Yates, 1994), is central to the intervention process in family-centered EI services. This relationship provides the child with their earliest experiences and interactions, significantly influencing how the child will learn to manage their emotions, relationships, and impulses throughout life (Barblett & Maloney, 2010; Guralnick, 1997; National Research Council and Institute of Medicine, 2002).

These foundational skills, learned early in childhood, lead to social-emotional competence and wellbeing later in life (National Scientific Council on the Developing Child, 2004a) for children with a diverse range of ability (National Scientific Council on the Developing Child, 2004b). It is within the context of such relationships that high-quality caregiver-child interactions can occur. These interactions have been broadly described in the literature as contingent (caregiver responds promptly following the child's behavior), appropriate to the child's behavior, and sensitive (caregiver responses match the child's mood and development) (Dunst & Kassow, 2008; Powell & Dunlap, 2010; Trivette, 2003). In a meta-analysis by Dunst & Kassow (2008) comparing multiple caregiver sensitivity characteristics and secure infant attachment, they found that secure attachment was most strongly related to explicit caregiver contingent social responsiveness. This was especially true for reciprocal caregiver/child contingent responsiveness, pointing to the importance of bi-directional, mutually pleasurable interactions between dyadic partners in increasing caregiver sensitivity and responsiveness, as well as infant attachment (Landry et al., 2008). Guralnick (1997; 2001) also highlighted the significance of caregiver-child interactions, while expanding to consider the various child and caregiver characteristics, family patterns of interaction, resources, and social supports that can influence the dyadic relationship. For instance, caregivers who have a child born with a diagnosed disability may experience increased distress, which may negatively affect the quality of caregiver-child interactions and contribute to social-emotional difficulties for the child. Alternatively, families may have opportunities to build on their strengths, enhance self-competence, and promote social-emotional wellbeing for themselves and their children. To do so, families may draw from a wide range of support systems, including informal supports, such as their community (Mogro-Wilson, 2011), and more formal supports, such as their team of educational professionals (Powell et al., 1997). EI

professionals often serve as a first line of support for families caring for their young children with disabilities.

The Role of Practitioners in Supporting Dyadic Relationships

Investigations and professional organizations in EI and early childhood special education illustrate the significant position of practitioners in supporting and strengthening the dyadic relationship between caregivers and their young children (Bagdi, & Vacca, 2005; DEC, 2014; Kong & Carta, 2011; NAEYC, 2011; Popp & Wilcox, 2012; Trivette et al., 2010). The Division for Early Childhood's recommended practice F5, states "Practitioners support family functioning, promote family confidence and competence, and strengthen family-child relationships by acting in ways that recognize and build on family strengths and capacities" (DEC, 2014). Additionally, among the core values stated in its Code of Ethical Conduct (NAEYC, 2011), the National Association for the Education of Young Children Development recognizes the need for practitioners to support the bond between child and family. In a triadic approach, practitioners support the caregiver-child relationship by interacting primarily with the caregiver, as the caregiver is recognized as the primary agent of change in the dyad. Therefore, positive and trusting caregiver-practitioner partnerships, also sometimes referred to as the *working alliance* (Halvorath, 2006), are key for enabling practitioners to strengthen caregiver-child relationships.

Adopting a triadic approach to service delivery aids EI practitioners in generating caregiver-practitioner partnerships that allow them to positively affect the caregiver-child relationship and position it at the center of intervention activities (McCollum & Yates, 1994; Yates, 2011). In their study investigating caregiver-practitioner partnerships in EI, Popp and Wilcox (2012) described several practitioner behaviors thought to promote positive caregiver-

practitioner intervention relationships, such as active listening, praise, warmth/positive regard, and inviting caregivers' participation. They also measured maternal responsivity during caregiver-child interactions. Based on their findings, the authors suggested that increases in maternal warmth and positive regard towards their children over time may have reflected increasingly trusting relationships with their EI practitioner. Research also indicates that *how* the dyadic relationship is supported by practitioners affects dyadic and child outcomes. In their meta-analysis, Trivette et al. (2010) found that capacity-building helpgiving and family-systems intervention practices are linked to both caregiver-child interactions and child development for children with and without disabilities and delays. More specifically, practitioners' increased use of capacity-building helpgiving practices positively related to both caregiver self-efficacy beliefs and family-systems interventions, which target family needs, supports, and strengths. In turn, intervention practices positively influenced caregivers' well-being and self-efficacy beliefs of control over practitioner helpgiving and their own life events. Ultimately, caregiver self-efficacy beliefs and well-being influenced the quality of caregiver-child relationships. Stated another way, these findings suggest that when practitioners engage in capacity-building helpgiving and intervention practices supporting family functioning, caregiver's sense of self-efficacy and overall well-being are supported. These positive caregiver outcomes support caregiver-child interactions, which can then strengthen child development.

A culturally aware stance is also helpful for building sound caregiver-practitioner partnerships in EI. According to professional organizations and research in the field, families are best served by professionals who can prioritize families' unique cultural values and center families' cultural, ethnic, and linguistic identities (Artiles & Kozleski, 2007; Dunst et al., 1991; Hanson et al., 1998; Kalyanpur & Harry, 1997). For instance, Harry et al. (1999) suggested that

practitioners recognize their own cultural beliefs about quality of life for a child or family and then compare their beliefs that differ from those of the caregiver through dialogue with the family. As practitioners gain a greater familiarity of the relativity of these beliefs, they can learn to understand and respect the diverse routines, perspectives, and competencies each family brings to the intervention relationship. While family-centered approaches inherently focus on individualizing interventions at the family level and recognizing families' unique capabilities, a keen self-awareness of family and practitioner's cultural positions benefit the quality of service delivery. Developing responsive, collaborative partnerships with caregivers allows practitioners to more effectively understand and support the dyad's unique relationship.

The Triadic Strategies

Implementation of triadic strategies provides practitioners with a framework for caregiver coaching that is geared towards improving caregiver competence and confidence with engaging in developmentally enhancing caregiver-child interactions (Dunst et al., 2019; Dunst & Trivette, 2009; McCollum et al., 2001). DEC (2014) references coaching among its instructional recommended practices, stating, "Practitioners use coaching or consultation strategies with primary caregivers or other adults to facilitate positive adult-child interactions and instruction intentionally designed to promote child learning and development." Caregiver coaching is primarily used with caregivers to support dyadic interactions, which foster positive family and child outcomes. The six triadic strategies of the PIWI framework (McCollum et al., 2001) encompass coaching behaviors, such as observing, listening, responding, commenting, hypothesizing, and evaluating (Rush et al., 2003; Yates, 2011), that are likely familiar to many EI practitioners. By explicitly defining them, practitioners can become more aware of their use during intervention activities and purposefully incorporate these behaviors during their

interactions with caregivers. These strategies require the presence of the intervention triad: the practitioner, the caregiver, and the child, and can only be described as triadic when used by the practitioner in the context of facilitating caregiver-child interactions. The triadic strategies (see Table 1) are listed in the following order: 1) Establish dyadic context, 2) Affirm parent competence, 3) Focus attention, 4) Provide developmental information, 5) Model, and 6) Suggest. When engaging in triadic interactions with the caregiver-child dyad, practitioners are encouraged to favor less intrusive strategies initially, moving from more to less direct involvement in caregiver-child interactions as the intervention relationship progresses over time.

Table 1

Definitions of the Triadic Strategies from the PIWI Framework

Strategy	**Definitions**	**Examples**
1. Establish Dyadic Context	Elements of the environment are arranged or rearranged to increase the probability of mutually enjoyable parent-child interactions, *when previously absent.*	• Facilitator positions child to increase dyadic interaction with the parent. • Facilitator shifts their position away from the child, so the parent is closer. • Facilitator moves toy that child wants to play with closer to where parent is sitting. • "Let's show your dad the toy." • "Mommy, come here, please."
2. Affirm Parent Competence	Developmentally supportive interactions are (*verbally)* warmly recognized and expanded upon, as are characteristics of child competence.	• "He looks so happy when you play with him in the water." • "She really likes to play with you like that." • To child: "Look how well I can do this after you showed me!" • To child: "I like it when you help me with that, mom."

3. Focus Attention	Aspects of the dyadic interaction are commented upon or questioned in order to draw the parent's attention to particular competences or actions in self or child *that may not have been previously recognized or noticed*.	• "I covered the toy, and Sarah found it!" • "Did you hear that? I think he just said 'baba'." • "Oh! He's pushing it out with his tongue. He's saying 'I don't like that'." • To child: "Look, dad, I can make it work."
4. Provide Developmental Information	Information about the child's development agenda is given by verbally labeling or interpreting the child's emotional, cognitive, language, and motor abilities within the context of play and interaction.	• "Look how well she was able to use her fingers to pick up that tiny piece of lint!" • "Did you see how he was able to remember where it was when you hid it for him?" • "I see that she's using both hands together with this toy now." • Through child: "I don't like it when you leave because I don't know yet that you will come back." • Through child: "Mommy, look...I've learned that turning this makes the clown pop out."
5. Model	Dyadic interaction roles are momentarily taken on by the facilitator, *while engaging the parent's attention*.	• "Notice how I move this away so that he will be safer when he climbs up." • "I can hold the base of this block tower so it's easier for him to build." • Facilitator establishes a turn-taking routine with child before inviting the parent to join.
6. Suggest	Facilitator provides parent with a specific suggestion for something to try with the child.	• Facilitator hands the parent a ball to roll with a child, paired with a prompt for the parent to engage the child • "I wonder what would happen if you roll it to her." • "Why don't you try rolling it to her?" • "Let's see what would happen if you roll it to her." • To child: "Why don't we have mom come over here and roll it with you?"

Many aspects of the triadic strategies (McCollum & Yates, 1994) can be mapped on to the underlying principles of family-centered service delivery in EI. For instance, to *establish dyadic context*, practitioners would arrange the environment to promote dyadic interactions in which both the caregiver and child are engaged in mutually enjoyable, developmentally supportive activities for the child. Implementation of this strategy ensures the establishment of the caregiver-child dyad as the unit of intervention (Dunst & Trivette, 2009), avoiding the provision of services delivered directly to the child. The second strategy, *affirm parent competence* directly reflects a primary aim of EI services (Dunst et al., 2002, Dunst & Espe-Sherwindt, 2016; Espe-Scherwindt, 2008). The practitioner uses this capacity-building strategy when they recognize and describe positive actions and competencies on behalf of the caregiver during interactions with their child, especially as they contribute to their child's developmental progress.

With *focus attention*, the third strategy, the practitioner contributes questions, comments, and expansions to the caregiver-child interaction, bringing particular competencies or actions of the child to the caregiver's attention. According to a meta-analysis by Dunst and Kassow (2008), caregiver behavioral interventions focusing on increasing caregiver sensitivity to their child's behavior was most effective in strengthening the caregiver-child bond. Such interventions directed caregivers towards a greater awareness of their child's behavior, more accurate interpretation of behaviors, and contingent social responsiveness to behaviors. Similarly, when implementing this strategy, practitioners focus caregivers' attention to their children's behaviors in the context of dyadic activities. The fourth strategy, *provide developmental information,* provides information to the caregiver about the child's actions during interaction through a developmental lens. Caregivers are believed to engage in higher quality interactions with their

children when they understand their child's development and the role they play in it, while feeling competent and confident in that role (Dunst & Espe-Sherwindt, 2006; Dunst & Trivette, 2009; Yates, 2011). In fact, Hess et al. (2004) suggest that caregiver interventions should include components that increase caregivers' knowledge of their child's development in correspondence with increasing feelings of caregiver self-efficacy. Failing to do so may lead to naively confident mothers who encounter parenting difficulties and increased need for EI services. Similarly, Sameroff and Fiese (2000) describe a process of caregiver reeducation in which caregivers are provided information about their children's development while also providing caregivers with alternate approaches for responding to the particular needs of their child in an effort to support their child's development.

The fifth strategy, *model*, involves the practitioner momentarily taking on the caregiver's dyadic role and working directly with the child to demonstrate alternate skills and activities for the caregiver to use between sessions. Modeling is a common practice in family coaching models (e.g., Friedman et al., 2012; Rush et al., 2003), recognized for supporting caregivers with building competence and confidence in supporting child development (Rush & Sheldon, 2011). For instance, Friedman and colleagues (2012) proposed a set of coaching strategies and definitions that promoted triadic approaches to interactions between practitioners, caregivers, and children, in which practitioners were encouraged to model developmental activities with children for caregivers while narrating their actions and intentions. Modeling also has the potential to contribute to caregiver empowerment by assisting caregivers with the acquisition of knowledge and skills that can support them in navigating activities related to family wellbeing (Dunst & Trivette, 2009). Finally, practitioners are encouraged to *suggest* specific actions for caregivers to do with their children during play or routine activities. These can be provided as feedback or

suggestions for caregivers to take on the modeled action. *Suggest* shares characteristics with another definition proposed by Friedman et al. (2012) - *guided practice with feedback* – in which the practitioner provides specific suggestions to the caregiver in the context of dyadic interactions to help support the caregiver implement developmentally-enhancing activities with their child. While each of these six strategies - *establish dyadic context, affirm parent competence, focus attention, provide developmental information, model*, and *suggest* - is evidence-informed and supported, there is a need to study them as a comprehensive set of coaching practices to be implemented in Part C services.

Complementary Components of Service Delivery

There are several contextual and environment factors for practitioners to consider in tandem with a family-centered triadic approach. These include key components of service delivery, such as setting (Dunst et al., 2014; McWilliam, 2012) and materials used, as well as factors that relate to how the practitioner chooses which strategies to use during sessions (McCollum &Yates, 1994). The issue of setting addresses where service delivery occurs. Providing services in the family home produces positive benefits, such as supporting the family culture, reflecting "natural environments" as described by Part C (Workgroup on Principles and Practices in Natural Environments, OSEP TA Community of Practice: Part C Settings, 2008), and supporting child and family competencies. For instance, caregivers are more likely to be involved in a capacity-building manner when services are delivered fully or partially in the home (Dunst et al., 2014). Additionally, the family's home is a natural learning environment, providing regular learning opportunities for the caregiver and child set in the context of daily family routines and activities (DEC, 2014a; Dunst et al., 2006; McWilliam, 2012; Swanson et al., 2011), with familiar play materials. For this reason, implementation of bagless intervention services is

recommended. Toy bags brought to home visits by practitioners distract from the child's daily routines, interfere with families learning how to support their child's development, and shift the focus away from family strengths (Williams & Ostrosky, 2020) and available resources. Nwokah et al. (2013) recommend that practitioners develop an awareness of families' mental health and sociocultural considerations, especially as they relate to poverty and play. McCollum and Yates (1994) describe guidelines for practitioners to select triadic strategies most appropriate for the dyad, such as matching the strategy to the individual strengths of the caregiver. Some families in select situations may benefit from higher levels of support as provided by more intrusive strategies (e.g., model and suggest), as opposed to less direct strategies. Practitioners are encouraged to follow the caregivers' lead with introducing more or less supportive strategies throughout the session, consider speaking directly to the caregiver or indirectly through the child's voice, and to support the caregiver in taking the child's perspective during activities.

Practitioner Use of Triadic Strategies

There is limited research specifically investigating triadic interactions among practitioners, caregivers, and children during intervention (Salisbury & Cushing, 2013), and virtually no intervention research targeting the triadic strategies as outlined by the PIWI framework. Of those studies focused on triadic approaches to coaching and intervention, there are several featuring promising results for practitioner, caregiver, and child outcomes, using the family-guided routines-based intervention (FGRBI) coding protocol to guide evidence of triadic strategy use. Brown and Woods (2016) conducted a multiple-baseline study and analyzed practitioners' use of caregiver coaching in caregiver-implemented communication interventions, specifically targeting their incorporation of triadic interactions. Coaching behaviors were defined based on FGRBI coding protocol, including definitions such as *direct teaching*, *demonstration*,

and *guided practice with feedback*. While these coaching behaviors emphasized the interactions between the practitioner and the caregiver intended to support caregiver-child interactions during developmental activities, they differed from PIWI triadic strategies in that they could occur outside of the context of caregiver-child interactions. Based on their findings, triadic communication interventions were feasible during both play and routine activities for caregivers, supported caregivers' use of intervention strategies, and increased children's communication targets (Brown & Woods, 2015). In their study comparing provider-led services with family-centered triadic service delivery, Salisbury and Cushing (2013) used a modified version of the FGRBI to investigate the effects of both approaches to intervention. Specifically, they analyzed video tapes of home visits and coded interactions for their form (who was leading or guiding it), function (what was the purpose), and focus (who was the focus of adult attention). Overall, they found that during sessions in which practitioners primarily employed triadic strategies (at least 70% of the time), both practitioner and caregiver behaviors differed from practitioner-led sessions. For instance, caregivers spent almost three times as much time focused on their children during these sessions and practitioners spent nearly twice as much time in joint interactions with caregivers and focused on caregivers. While practitioners in this study intentionally manipulated their behaviors to exhibit either practitioner-led or triadic styles of interaction, caregivers were innocent to these conditions. These findings support the notion that caregiver responses are differentially affected by the approach to service delivery and corresponding intervention strategies used by practitioners. Furthermore, they point to the potential for more family-centered triadic strategies to increase caregiver-child interactions during intervention activities (McCollum & Yates, 1994; Mahoney, 2009; Yates, 2011), thereby

affording families greater competency-enhancing opportunities (Dunst & Espe-Sherwindt, 2006; Dunst & Trivette, 2009).

Studies examining home-visit quality in programs outside of Part C show benefits related to home-visit quality as a result of practitioner use of triadic strategies, though incidence of triadic interactions is limited. In their study examining interactions between home visit participants as part of the Maternal, Infant, and Early Childhood Home Visiting (MIECHV) program, Hughes-Belding (2019) and colleagues measured time spent in triadic interactions and home visit quality using the Home Visit Rating Scale-Revised (HVRS-R) and the Home Visit Observation Rating Scales (HVORS; Roggman et al., 2019), respectively. Based on observational data via the selected measures, home visitors were found to spend little time in triadic interactions (19%), with most of their time spent directly engaged with the child's caregiver (69%). However, data also confirmed that time spent in triadic interactions with a focus on child-related content (e.g., child's health and safety, child's development, and care issues) was associated with higher quality home-visitor practices and family engagement. In a closer look at triadic strategies in MIECHV home visiting programs (Peterson et al., 2018), participants were found, again, to spend little time in triadic interactions (17%), with most of that time (15%) devoted to practitioners observing caregiver-child interactions or modeling adult-child activities for the caregiver. Negligible time was spent facilitating caregiver-child interactions. Additionally, an initial investigation of triadic strategies and home visit quality indicates alignment between home visit quality and EI practitioner use of triadic strategies. According to HOVRS ratings, higher quality home visit sessions were linked to observations of increased practitioner use of triadic strategies (Fettig & Harbin, 2018; 2019).

Virtual EI Services

In the last twenty years, researchers have begun to explore the feasibility of delivering EI services virtually instead of in-person, and the literature base is growing. Virtual services are often referred to as *telepractice* (Behl et al., 2017), *teleintervention* (McCarthy et al., 2010), or *telehealth* (Cason et al., 2012), and involve EI services provided via computer technology using video conferencing platforms (e.g., Zoom, Skype) (Poole et al., 2020). Studies investigating virtual service delivery have shown promise with supporting caregiver training for young children with ASD (Meadan et al., 2016), providing access to services for families in rural locations (Ashburner, 2016), practitioner implementation of caregiver coaching practices (Behl et al., 2017; Olsen, 2012), and improving child outcomes for young children who are deaf/hard-of-hearing (Blaiser et al., 2013). Documented benefits of teleintervention include supporting maternal responsiveness (McDuffie et al., 2013), enhancing caregivers' sense of empowerment (Meadan et al., 2016), and reducing costs for practitioners (Ashburner et al., 2016; Kelso et al., 2009). Caregivers particularly expressed positive outcomes from virtual services. For instance, in their qualitative study comparing remote and in-person services for families of young children with ASD, Ashburner et al. (2016) found that caregivers reported receiving more flexible support from practitioners at a lower cost and greater convenience when participating in remote services. Caregivers also believed remote sessions with practitioners increased their skills in supporting their child's development, due to an emphasis on caregiver coaching. Similar caregiver reports were found by Kelso et al. (2009), in which caregivers felt they had more uptake in intervention skills, though they also missed the lack of practitioner-child interactions. Relatedly, practitioners in this study noted discomfort with the shift they experienced in their role from providing direct-to-child services to coaching caregivers, as they felt more accustomed to working directly with

the child. Stredler-Brown (2017) had consistent findings, supporting an increased use of family-centered practices by practitioners in telehealth visits compared to in-person. Findings for this study were confirmed by coding practitioner behaviors of their recorded home visits with families.

Research investigating the use of teleintervention in EI services for families of young children who are deaf/hard-of-hearing show promise for child and family outcomes, cost analyses, and use of caregiver coaching practices (Behl et al., 2017; Blaiser et al., 2013). For example, Behl et al. (2017) examined the use of family-centered caregiver coaching practices among EI practitioners serving families of young children who were deaf or hard-of-hearing. Using measures for child outcomes, the use of family-centered practices, and home visit quality, investigators compared telepractice visits to in-person visits. Overall, findings indicated that families in the telepractice group received more service hours than those in-person, and that children in the telepractice group showed similar, if not slightly better, outcomes compared to children receiving traditional in-person visits. Additionally, use of family-centered practice differed between groups, demonstrating that caregivers showed more engagement in sessions and practitioners were more responsive to families in the telepractice group. These findings are encouraging indicators of teleintervention's potential to support child outcomes, in addition to promoting family-centeredness of service delivery and providing benefits for EI practitioners. While most studies investigating teleintervention focus on a specific target for intervention (e.g., deaf/hard-of-hearing populations; Blasier et al., 2013; autism specific; Vismara et al. 2012), there is a need to further build the evidence on teleintervention services for EI service delivery to promote child development and caregiver-child interaction.

Training and Implementation

Considering the calls for implementation of family-centered EI services, the relevance of a triadic approach to service delivery, and the documented (though limited) benefits to home visit quality, the question of practitioner training in the field is next to be explored. The remainder of this review will explore research describing barriers to training and implementation of family-centered EI practices, as well as recommendations for practitioner training. In consideration of the current climate of education, due in part to COVID, topics related to virtual training, coaching, and implementation (by both practitioners and caregivers) will be described as well.

Barriers to Training and Implementation

In response to the primarily child-focused traditional style of EI service delivery still widely in practice (Campbell & Sawyer, 2009; Hebbeler & Gerlach-Downie, 2002; McBride & Peterson, 1997; Peterson et al., 2007), several researchers have queried barriers to implementation of recommended practice in EI service (Campbell & Sawyer, 2009; Fleming et al., 2011; Ozdemir, 2007; Sawyer & Campbell, 2009). Ozdemir (2007) summarized three potential roadblocks originally presented by Bailey et al. (1992), which are 1) overall challenges that come with shifting broad practices in a field, 2) lack of training for practitioners in skills needed for working collaboratively with families, and 3) a lack of guidelines clearly outlining implementation of family-centered practices. Perhaps related to Ozdemir's first point, several other researchers contend that the beliefs held by EI practitioners are a primary barrier to change (Campbell & Sawyer, 2009; Fleming et al., 2011; Sawyer & Campbell, 2009). Practitioner beliefs may simply not align with the principles of family-centered practice, as suggested by McWilliam (1999). In a survey capturing practitioner beliefs regarding participation-based

services, Sawyer and Campbell (2009) found that EI practitioners and especially preservice teachers showed strong beliefs opposed to the statement “the role of the early intervention providers should be to train, teach, or coach the caregivers—not work directly with the child,” while faculty respondents did not demonstrate beliefs in contrast to such practices. This may reveal a dissonance between "expert" recommendations for promoting children's learning in the context of family routines and activities and practitioner beliefs of meaningful intervention. In their qualitative study comparing beliefs around participation-based practices of practitioners who engaged in either traditional or family-centered work, Fleming and colleagues (2011) surfaced relevant themes. For example, practitioners considered that as an interventionist, their role was to advance the child’s development, but not in the context of increasing the child’s access to or participation in family routines and activities. Similarly, while practitioners recognize that caregivers were the one to teach the child (Campbell & Sawyer, 2009), practitioners did not report that they supported caregivers to be teachers to their children, though they did identify this as an ideal component of service delivery. Furthermore, practitioners considered caregiver characteristics (e.g., attentiveness of caregiver and willingness to follow through with suggestions) to be a primary barrier to delivering optimal family-centered services. This last finding was consistent with Douglas et al. (2020) in which practitioners noted that families often didn’t understand their role as the child’s teacher in EI. Language differences between the practitioner and the caregiver were also reported.

Inadequate training is another potential barrier to shifting practice within the field to family-centered service delivery and may contribute to confusion among practitioners regarding implementation guidelines (Bruder, 2010; Douglas et al., 2020; Dunst et al., 2019; Fleming, 2011; Ozdemir, 2007; Woods et al., 2011). Research suggests that practitioner preparation

programs, inservice professional training, and technical opportunities are limited (Bruder, 2010) and varied (Bruder & Dunst, 2005), producing EI practitioners who don't feel sufficiently prepared to work with families (Bruder et al., 2013; McBride and Peterson, 1997). This effect is heightened when practitioners are called to work with culturally and linguistically diverse families (Banerjee & Lunckner, 2014), which is increasingly the case in the field of education (Musu-Gillette et al., 2016). Studies investigating practitioners' self-efficacy beliefs, competence, and confidence support these claims. Practitioners report feeling more confident than competent when working with families overall, with low scores for confidence and competence in several essential components of EI service delivery, including incorporation of natural environment factors and family-centered practice (Bruder et al., 2011). Some evidence has linked higher overall self-efficacy with more years of practice in the field (Lamorey & Wilcox, 2005). Correspondingly, Raab and Dunst (2004) found that more experienced practitioners provided descriptions of natural learning environments that were more closely aligned with contemporary recommendations and requirements related to everyday learning environments while less experienced practitioners reflected more traditional conceptualizations. However, training opportunities are not necessarily successful in changing practitioner beliefs to shift. After a professional development opportunity focusing on a participation-based, family-centered approach to service delivery, Campbell and Sawyer (2009) found no significant changes in practitioners' beliefs. In fact, after the training, practitioners maintained that it is acceptable that they work directly with the child, not the family, when the family preferred this approach. These findings beg further consideration of effective training components for successful implementation of family-centered triadic approaches. The following section describes how Part C programs and investigators have approached initial and ongoing professional training for EI

practitioners in implementing family-centered practices in their home visit sessions with young children and families.

Recommendations for Training

A variety of professional development training formats have been used to teach recommended practices in EI (Artman-Meeker et al., 2015), though several components have been regarded as essential in enhancing practitioners' implementation of learned practices. The general consensus for shifting practitioners' beliefs, knowledge, and practices is to provide contextual, learner-centered, interactive training that can be applied to their work and includes regular follow-up assessment (Bruder, 2010; Hile et al., 2016; Snyder & Wolfe, 2008; Trivette et al., 2009). Professional development opportunities typically begin with an initial training session (Campbell & Sawyer, 2009), frequently in the context of in-service training or staff development (Snyder et al., 2011), which provides foundational knowledge and theory, introduces and illustrates key practices and rationale, and potentially creates a safe space to practice new skills and receive feedback (Fixsen et al., 2009; Trivette et al., 2009). For example, Campbell and Sawyer (2009) began training practitioners in participatory-based practices with two three-hour training sessions consisting of shared information, video examples of practices, opportunities for practitioners to practice coding videos to identify practices and facilitated discussion.

Follow-up training components, such as coaching, can significantly improve practitioners' implementation of strategies, thereby supporting caregiver intervention of responsive, developmentally enhancing interactions with their child (Bruder, 2010; Dunst et al., 2013; Snyder & Wolfe, 2008; Trivette et al., 2009). As suggested by Joyce and Showers (2002) and echoed by Fixsen et al. (2005), such follow-up activities are needed to ensure that practitioners effectively implement newly acquired skills. Within the fields of EI and early

childhood special education, coaching has been used as a professional development activity in several contexts and settings, with different dosages, styles, and outcomes (Artman-Meeker et al., 2015; Kemp & Turnbull, 2014; Rush et al., 2003). While a goal for coaching is ultimately to improve practitioner quality and child outcomes (Dunst, 2015), how coaching programs meet that goal can vary in form and content. Examples of various coaching approaches include instructional support (Fox et al., 2011; Knight, 2007), practice-based coaching (Snyder et al., 2015), reflective practices (Rush et al., 2003), and relationship-based models (Chu, 2014). In the context of EI, McCollum (1994) cited ongoing reflection practices as especially important for supporting practitioners in developing and maintaining healthy relationships with a diverse range of caregivers and professionals. In order to be effective, coaching requires an ongoing commitment from all participants involved, though the scope of this commitment may shift according to the prescribed coaching program (e.g., frequency of meetings and medium for feedback). Coaching is recognized as a collaborative activity and has the potential to, "promote self-observation, self-correction, and an ongoing learning process through examination, reflection, discussion, and refinement of one's knowledge and skills" (Rush et al., 2003, p. 34). Coaching provides opportunities for practitioners to practice implementing newly learned skills in real-life work contexts, evaluate their implementation, reflect on potential improvements to implementation, and assess their implementation experiences according to a relevant, meaningful framework (Trivette et al., 2009).

Online Professional Development and Coaching

Research suggests that online or virtual delivery of professional development and coaching activities may support practitioners with implementing newly learned skills. Investigations on the feasibility of online models for PD activities show promise (Kyzar et al.,

2014), as a more flexible option for practitioners looking for training not available in their immediate regions, such as those living in more remote areas who desire access to greater content **(**Bullock et al., 2008). It also provides learning opportunities for practitioners with limited resources available to support the time, transportation, or funding required for training (Cason, 2011; Kyzar et al., 2014; Marturana & Woods, 2012), or those seeking training during the COVID pandemic.

Virtual coaching provided with or without an initial training or workshop, also referred to as *e-coaching* (Fettig et al., 2016), is commonly conducted among coaches and practitioners via email (Barton et al., 2018; Krick Oborn & Johnson, 2015) or video conferencing (Fettig et al., 2016; Marturana & Woods, 2012; Meadan et al., 2020). Investigations using e-coaching incorporate various characteristics, including coaching observations of home visit videos (Meadan et al., 2020), performance-based feedback (Barton et al., 2018), and online content modules (Brown & Woods, 2012). Studies also commonly target increasing practitioner implementation of family-centered caregiver coaching strategies (Brown & Woods, 2012; Marturana & Woods, 2012; Meadan et al., 2020). For instance, in their study investigating a multicomponent professional development approach to EI practitioner learning, Marturana & Woods (2012) measured practitioner use of caregiver coaching strategies. In addition to attending in-person training, mentor teams (composed of two practitioners and one "expert") met regularly via skype or conference call. After receiving home visit videos from practitioners, experts scheduled a follow up with teams, during which time they addressed each provider's video-recorded home visit session, and discussed peer feedback with each other. Expert mentors reviewed videos and chose two one-minute video clips to use for discussion and performance-based feedback about two goals chosen by practitioners in a previous session. Following training

and coaching, practitioners demonstrated increases in implementation of targeted caregiver coaching strategies embedded into family routines and decreases in their use of child-focused strategies. Engaging in both components of professional development improved practitioner outcomes by increasing their use of recommended, family-centered strategies (DEC, 2014). Research also demonstrates e-coaching's effectiveness in improving practitioner learning outcomes compared to training alone (Fettig et al., 2016; Krick Oborn & Johnson, 2015; Meadan et al., 2020). Fettig and colleagues (2016) conducted a study showing differential effects after training and coaching on child and EI practitioner outcomes. After participating in an in-person training on functional assessment intervention, e-coaching was introduced for one set of learned strategies. Coaching sessions occurred once per week within two days following home visit sessions, lasted 30-45 minutes, and were conducted via a videoconferencing platform. Content of these sessions included practitioner reflection on target strategy use, performance-based feedback from the coach (including video clips to support feedback), and Q&A between the practitioner and coach. When the practitioner implemented the first set of strategies at a high, consistent rate, the next set of strategies became the target of coaching. This study shows that the practitioner's implementation of intervention strategies learned during training increased after coaching and maintained at higher levels even after coaching is withdrawn. Additionally, children's challenging behaviors decreased after coaching. This demonstrates the positive effect of coaching on bolstering learning and supporting practitioners with applying learned strategies to applicable field contexts.

Broad Purpose of Study

While the current pandemic provides few benefits for communities, it serves as a catalyst for change. This literature review aimed to provide an in-depth exploration into the current, and

idealized, practices that investigators are navigating in EI as the field continues towards its purpose of improving child and family outcomes. Recommended shifts to the use of family-centered triadic approaches in EI have been conceptualized as promoting positive outcomes for families, young children, and practitioners, with promise shown in initial intervention research. As virtual training, coaching, and service delivery become more prevalent, research is needed to further investigate their capacity to support practitioners with implementing the quality of service called for by professional organizations and researchers in this field. While virtual delivery of professional development and family service are a necessity at this time, it may pave the way for progress for multiple stakeholders in EI.

CHAPTER 3

Methods

Research Design

This study employed an explanatory sequential mixed methods design, beginning with a quantitative phase extended by a qualitative phase (Creswell & Plano Clark, 2017). It used a single-case research (SCR) design to investigate the effects of the intervention, followed by qualitative interviews to examine individual experiences. This approach allows researchers to observe and examine relationships between intervention variables and use qualitative inquiry to help explain data patterns found in quantitative results. Consistent with an explanatory sequential design, results were reviewed after the quantitative phase to inform the development of the qualitative phase and then integrated at the end of qualitative data collection to merge findings (see Figure 1). Using an explanatory mixed methods design was an appropriate fit for this study as it allowed for an investigation into the effectiveness of training and coaching on increasing EIP's use of triadic strategies and improving caregiver-child (referred to henceforth as the "dyad": McCollum & Yates, 1994) interactions during teleintervention sessions, while also understanding more about participants' lived experiences of the intervention. Researchers and trainers need to know what factors served as barriers, what components of triadic service delivery were potentially most beneficial for EIPs and caregivers in the study, and how the intervention improved participants' quality of life (Corr et al., 2020). Such contextual information may support the success of future interventions in tailoring practices to families' unique needs.

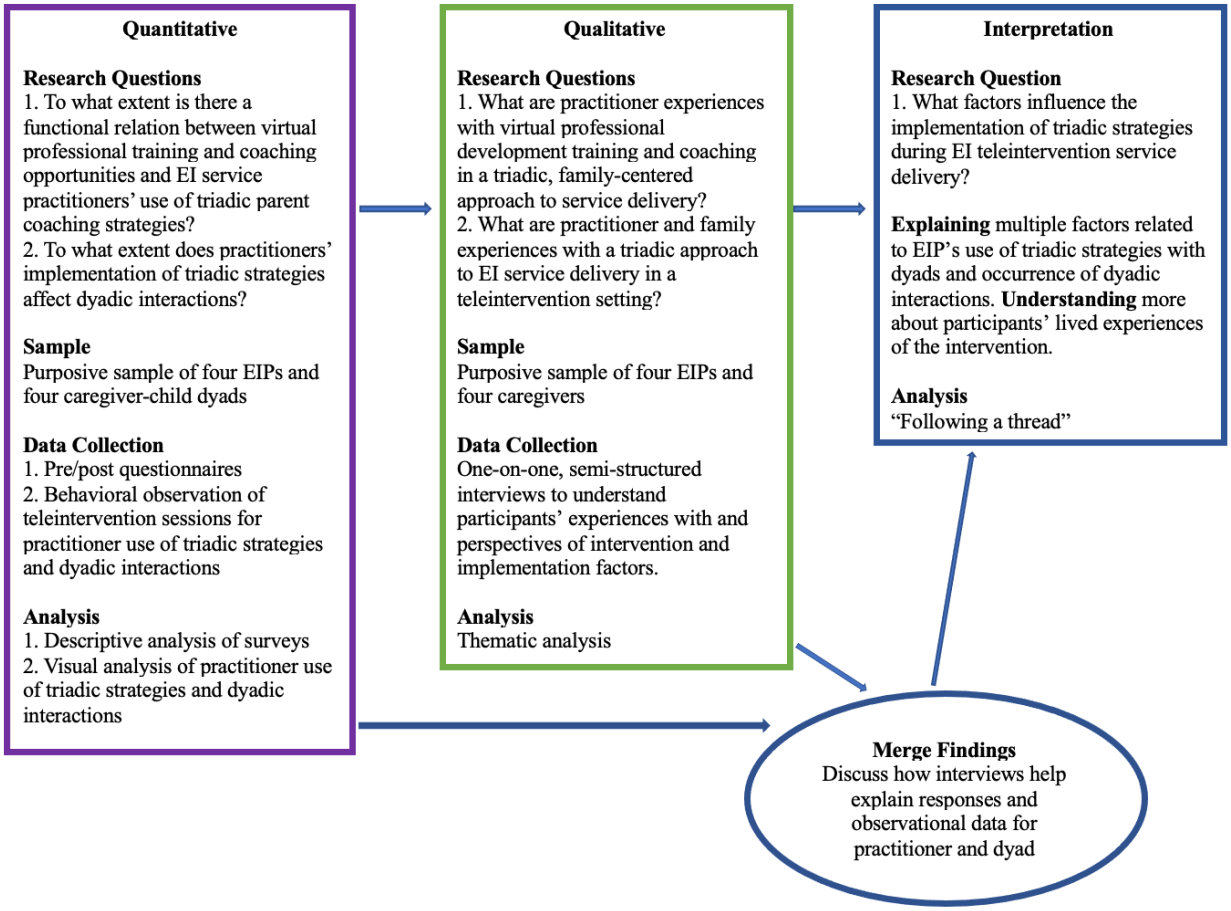
The SCR of the proposed study incorporated a multiple-baseline design across participants implemented according to What Works Clearinghouse Design Standards

(Kratochwill et al., 2013; WWC, 2020). Using SCR design allows for an examination of the functional relationship between intervention variables (initial training and ongoing coaching) and participant outcomes (practitioner use of triadic strategies and quality of dyadic interactions) (Gast & Ledford, 2018). Specific use of the multiple-baseline design provides an opportunity for researchers to stagger the introduction of the intervention components (training and coaching) to participant triads at variable moments. Additionally, reversal of the intervention is not required (Ledford et al., 2019). All participating triads began with a baseline condition, with the intervention introduced to participant triads when initial baseline levels were stable. The intervention continued to be assigned to participant triads until it was implemented across participants.

Following SCR, two semi-structured qualitative interview guides (one for caregivers; one for practitioners) were developed, as informed by quantitative results. One one-on-one interview was conducted with each practitioner and caregiver participant to inquire about their experiences with and perspectives of EI services, as well as intervention components. Using qualitative methods after SCR allows researchers to tailor interviews to query specific intervention results and better understand what contextual factors contributed to those results.

Figure 1

Explanatory Mixed Methods Design (QUAN + qual)



Philosophical Assumptions

Lastly, this project was guided by a pragmatist worldview (Creswell & Plano Clark, 2017), signaling the shared values of researchers, which is, in this case, a large body of mixed methods researchers. Pragmatism has evolved throughout the careers of multiple scholars (e.g., Dewey, 1925 to Morgan, 2007) and was initially linked to mixed methods research in the literature by Tashakkort and Teddlie (2003). This worldview focuses on the consequences of research and the use of multiple methods and approaches for data collection (e.g., quantitative and qualitative), emphasizing employing what works to address the research questions, which are

considered to be of utmost importance. Pragmatism recognizes the possibility of singular and multiple realities among participants and of both biased and unbiased perspectives among researchers. Furthermore, it values practicality in research and releases researchers from choosing between worldviews (e.g., postpositivism and constructivism) in their work. In this current project, we adopted both a behaviorist and interpretivist stance (Torbert, 2000), as evidenced by our incorporation of both SCR and qualitative methods. For the former, we relied on observations of participants embedded in contextual environments in which we introduced a change - an intervention - to produce a response. Behavioral observations comprised the data for this approach. For the latter, we invited conversation with participants via qualitative interviews to explore the subjectivity present among our participants' experiences with the research activities. Using these two approaches helped us account for the multiple realities and perspectives of participants' lived experiences while answering our research questions with tools that most fit our inquiry.

Participants and Setting

Four triads, each consisting of one EI practitioner, one child, and the child's caregiver(s), participated in this mixed methods study. Participants were recruited as triads (caregiver-child-practitioner) to learn more about implementation of practices during EI service delivery sessions and participants' experiences with these practices. Practitioners were recruited initially, and families were selected and recruited through participating EI practitioners. According to What Works Clearinghouse standards, this sample size represents an appropriate number for a multiple-baseline single-case research design (WWC, 2020). The inclusion of four triads allowed for a minimum of eight total phases, including baseline, intervention, and maintenance. In

addition, we aimed for a minimum of four total data points per triad, per phase, to meet *WWC SCD Standards*.

Sample

Participants were recruited from EI agencies within Washington State. Collaborating agencies were identified as those providing teleintervention services to families and young children, for which researchers could virtually observe recordings of practitioner practices and dyadic interactions. Agency leaders assisted with recruitment by circulating emails from researchers to EIPs working for their agency and inviting EIPs to contact researchers for more information. Sampling was done purposively from collaborating EI agencies in Washington state. Participating practitioners responded to outreach from research staff, including emails and flyers distributed to collaborating agencies. Participating EIPs then identified potentially interested families of young children with disabilities whom they served, and interested families contacted researchers to learn about study procedures and provide consent. We aimed to recruit a diverse range of professionals and families, demonstrating diversity in race, ethnicity, preferred languages, and experience.

Inclusion criteria for EI practitioners for this study were as follows: 1) practitioners work as an EIP in the role of special educator, SLP, PT, or OT, with at least a Bachelor's degree level of education, 2) they are currently employed by an EI agency located within the state of Washington, 3) they currently serve young children with disabilities and their families, 4) they are the current practitioner for a participating child and their caregiver, 5) they have been practicing in the field of EI for at least six months, and 6) and they anticipate that they will be employed in their current position for the six-month study period (January to June of 2021).

Eligible caregiver-child dyads represented the following inclusion criteria: 1) dyads received EI services from a participating provider within Washington state and were expected to continue receiving EI services until at least June 2021, 2) dyads were scheduled to see practitioners weekly, 3) children were between the ages of 12 months old and 30 months old at the beginning of the study (anticipated January 2021) and had a diagnosed disability or delay, 4) participating caregivers were the primary caregiver present during EI sessions.

Recruitment

Potential participants from within collaborating agencies were notified of this research opportunity by email and flyers circulated by agency leadership. Initially, recruitment emails were circulated to approximately 30 EI programs from across the state and 15 practitioners screened from other studies. Nine program coordinators responded that they would circulate the opportunity among their staff. Practitioners interested in joining the study were invited to meet with research staff to ask questions about participation, learn about study procedures, and provide consent to participate. Twelve EI practitioners scheduled information meetings with the lead researcher, and four reported that they did not have families on their caseload who would match inclusion criteria. Eight practitioners consented to participate and contacted one or more families to join in the study with them. All eight practitioners identified one participating family, who contacted the lead researcher individually for study information and signed consent forms. One practitioner identified a family whose primary language was Vietnamese; consent forms and other related study materials (e.g., questionnaires) were translated to Vietnamese. The primary caregiver in this family completed the consent process. Additionally, this family used interpretation services to support all teleintervention visits and study activities.

During baseline, two triads withdrew from the study due to reduced service hours for the family. For both triads, teleintervention sessions were moved to bi-monthly instead of weekly. One other triad was dropped from the study after multiple missed sessions. As a result, five practitioners were introduced to the training and coaching intervention. After two coaching sessions, one other triad was dropped because of multiple missed sessions. Thus, four triads (see Tables 2 and 3) participated in all intervention activities (at least five coaching sessions and corresponding teleintervention sessions) and remained in the study until its completion. We describe each triad in the following sections. All names were changed to pseudonyms, which the participants chose for themselves.

Triad 1

Triad 1 consisted of Jannie, her daughter, and their EI special educator, Lauren. Lauren identified as a White female and had been working in her current role for approximately three years. During that time, she had experience providing both teleintervention and home visiting services. Prior to that, Lauren worked in ABA therapy and spent her first four years after receiving her Masters degree as a classroom teacher in K-2 settings. Her primary language was English. Jannie and her daughter identified as Asian, spoke Vietnamese as their primary language, and had the same interpreter present for all EI sessions. He also attended all EI teleintervention sessions for this project and supported study activities for Jannie. Jannie's daughter did not have a diagnosis but qualified for education and speech therapy through their EI agency. Jannie's older son was diagnosed with Autism and was sometimes present for their sessions with Lauren. Lauren had only ever worked with the family over teleintervention, but Jannie was looking forward to Lauren coming to her home for visits once the agency policies changed.

Triad 2

Triad 2 included Jane, her son, and their EI practitioner named Phoebe. Phoebe identified as a White female and provided education services for families, with seven years of experience in her current position. She held a Bachelors degree. Phoebe had experience with teleintervention and home visiting, but only supported Jane and her son over teleintervention. Jane also identified as a White female and received EI services with her son for approximately one year. He did not have a diagnosis but was on an extensive waitlist to see a neurodevelopmental pediatrician and qualified for education, speech, and occupational therapy services. Phoebe and Jane had not yet met in person; all EI services for this triad had been provided via teleintervention. Each identified English as their primary language.

Triad 3

Triad 3 included Sharon, her daughter, and their EI practitioner named Beau. Sharon's husband, the father, was often present for part or most of the intervention sessions, sometimes in the room with Sharon and their daughter, sometimes remotely from another location. Sharon identified as a White female and received EI services with her daughter and family for less than a year. Beau was a physical therapist who had recently graduated with a Doctorate degree. Beau had been providing EI services for less than a year; they had only ever provided services via teleintervention and had not met their participating family in person. Beau identified as a White, nonbinary individual. All participants in this triad spoke English as their primary language. During the study, Sharon's daughter had a diagnosis of Global Developmental Delay and was told by their pediatrician that their daughter did not exhibit red flags for Autism.

Triad 4

Triad 4 consisted of Taryn, her daughter, and their speech-language pathologist, Flora. Similar to Triad 3, Taryn's husband, and the father, was sometimes present for teleintervention sessions either in lieu of, or in addition to, Taryn. Taryn's daughter did not have a diagnosis and qualified for speech services only through their EI agency. She was on a waitlist to see a neurodevelopmental pediatrician for a more extensive evaluation. This family received EI services for just under a year and had only participated in teleintervention services with their practitioner, Flora. Taryn and Flora each identified as White and female. Flora was trained as a speech-language pathologist and had been working in EI for two years since receiving her Masters degree. She had previous experience conducting home visits prior to providing services via teleintervention.

Table 2

Practitioner Demographics

Participant	Preferred language	Race/ ethnicity	Gender	Role	Years in role	Highest level of education
Lauren	English	White	Female	ED	3	Masters
Phoebe	English	White	Female	ED	7	Bachelors
Beau	English	White	Nonbinary	PT	<1	Doctoral
Flora	English	White	Female	SLP	2	Masters

Note. ED = educator; SLP = speech language pathologist; PT = physical therapist

Table 3

Caregiver Demographics

Participant	Preferred language	Race/ ethnicity	Relationship to child	Child gender	Years receiving EI	EI services received
Jannie	Vietnamese	Asian	Mother	Female	1	SLP, ED
Jane	English	White	Mother	Male	1	SLP, OT, ED
Sharon	English	White	Mother	Female	<1	SLP, PT
Taryn	English	White	Mother	Female	<1	SLP

Note. ED = education; SLP = speech language pathology; OT = occupational therapy; PT = physical therapy

Setting Note

At the time of the study, the conditions in our country required that most EI agencies operate virtually to protect individuals and communities from COVID-19. In accordance with these demands, all research procedures, including meetings, home visits, observations, and interviews, were conducted virtually, using a video conferencing platform (e.g., Zoom). In addition, researchers and participants were expected to take part in virtual research activities in appropriate environments.

Dependent Variables and Measures

The dependent variables and measures are described for quantitative and qualitative data strands, including the Demographic and EI Experiences Questionnaire, the PIWI Strategies Coding Sheet, the Interview Protocol, and the Dyadic Interactions Coding Sheet. Descriptions of these instruments follow, such as the concept it measures, administration, scoring, and inclusion of the instrument in the study.

The Demographic and EI Experiences Questionnaire

This researcher-developed measure solicited differential information for caregivers and practitioners. Both questionnaires included items asking for participants' gender, race, age, level of education, and employment details. The full Demographic and EI Experiences Questionnaire took approximately 10-15 minutes for participants to complete

Practitioners completed Likert scale items elaborating on their experience working in EI, such as years in the profession, the typical number of families on their caseload, comfort with supporting families in home contexts, and comfort with supporting families via teleintervention. Practitioners also rated their perception of their working alliance with families (de Greef et al., 2018) by providing a rating for the statement, "Parents and I are working towards mutually agreed upon goals." They also rated their comfort level with involving families during sessions by indicating their preference of family involvement using the Parent Involvement in Early Intervention (PIEI) prompt embedded in the questionnaire. This prompt measures active practitioner involvement of caregivers in ongoing EI sessions, via a Likert-style rating scale reflecting child-centered to family-centered participation using the following rating choices: (1) I prefer that caregivers are not present when working with the child who receives early intervention services; (2) I prefer families observe my work with the child; (3) I prefer to explain what I am doing during work with the child; (4) I prefer to show me or demonstrate how to do the interventions with the child; and (5) I prefer to involve caregivers in a way where they can continue to do the interventions without my ongoing assistance (Dunst et al., 2014). In a study conducted by Dunst and colleagues (2014), responses 4 and 5 were used to define the type of caregiver involvement in EI most consistent with the family capacity-building focus of Part C of

IDEA. Drafts of the Demographic and EI Experiences Questionnaires for practitioners and caregivers can be found in Appendices A and B.

Caregivers reported information related to their family and their experiences in EI, such as family members, age of children, years of service received, details of their intervention team, and overall satisfaction with service delivery. Additionally, caregivers rated their perceived working alliance (de Greef et al., 2018) with EI practitioners by providing a rating for the statement, "Our EI practitioner and I are working towards mutually agreed upon goals." Caregivers also indicated their involvement in service delivery by completing the Parent Involvement in Early Intervention (PIEI) prompt, indicating which of five responses "best describes how you are involved with your EI practitioner" (Dunst et al., 2014). This prompt measures active practitioner involvement of caregivers in ongoing EI sessions via a Likert-style rating scale reflecting child-centered to family-centered participation. The five response categories for caregivers included: (1) I am not present when my child receives early intervention services; (2) I only observe the service provider working with my child; (3) the service provider explains what he or she is doing with my child; (4) the service provider shows me or demonstrates how to do the interventions with my child; and (5) the service provider involves me in a way where I can continue to do the interventions without the provider's ongoing assistance. Similar to the practitioner prompt, responses 4 and 5 reflected a capacity-building focus for caregiver involvement.

The full Demographic and EI Experiences Questionnaire was expected to take approximately 10-15 minutes for participants to complete and the isolated PIEI prompt was expected to take 2-3 minutes for participants to complete.

The PIWI Strategies Coding Sheet

The PIWI Strategies Coding Sheet (see Appendix C) was used to capture EI practitioners' use of the six triadic strategies from the PIWI framework (McCollum et al., 2001, including 1) establish dyadic context, 2) affirm parental competence, 3) focus attention, 4) provide developmental information, 5) model, and 6) suggest. The coding sheet provided a definition and illustrative examples for each strategy and was used by members of the research team to observe and code the entirety of each teleintervention session submitted by EI practitioners.

Coding of Practitioner Behavior. Researchers coded teleintervention videos using paper and pencil 10-second partial interval recording (PIR) and the PIWI Strategies Coding Sheet to record practitioner use of triadic strategies. This interval coding system and interval length are used widely in EI and early childhood special education research (Lane & Ledford, 2014). With PIR, researchers record practitioner use of each unique strategy used within a ten-second interval by writing the designated code (e.g., MO for Model) in the field corresponding with the appropriate ten-second interval of time. If a practitioner implements a strategy beyond the ten-second interval, coders continue to apply the code to all subsequent intervals in which the strategy is used. More than one strategy may be coded for any single ten-second interval. Researchers calculated codes (a) to describe the number of intervals in which strategies occur across the length of the teleintervention visit, and (b) to determine the proportions of different strategies used (i.e., what % of triadic strategies used was coded as MO). To determine the practitioner's time spent implementing triadic strategies, the total number of intervals with triadic strategies were divided into the total number of intervals for the session and calculated into percentages. The total number of intervals containing each strategy was then divided into the total number of intervals containing triadic strategies and calculated into percentages. These

calculations represented the proportion of each strategy used by the practitioner. Coding practitioner use of newly learned triadic strategies during teleintervention sessions with this measure also tracked practitioners' intervention fidelity. Coding for this variable began once the practitioner, the caregiver, and the child were present. Intervals were excluded from coding if any of the following criteria were met: (1) the recording was unclear due to issues with technology, (2) the caregiver and child were not present, (3) the practitioner was not present on the screen, and (4) the practitioner and caregiver were addressing administrative issues (e.g., IFSP goals, program placement, and ongoing scheduling.

Practitioner implementation of triadic strategies was coded according to strategy definitions as outlined in Table 4. Definitions for triadic strategies were based on those developed as part of the PIWI framework (McCollum et al., 2001) and revised for clarity and application to a teleintervention setting. Descriptions in the "Examples/Non-examples" column illustrate actions and comments made by practitioners which, unless noted, are directed to the caregiver. Efforts were made to clearly differentiate strategy definitions for implementation and coding purposes. Twice monthly coding meetings occurred with the lead researcher and research assistants to address coding questions, discuss coding disagreements, and refine codes according to practitioners' communicative style. For instance, coders observed that while one practitioner may deliver most of their suggestions in the form of direct statements, another would make suggestions indirectly, in the form of a question.

Table 4

Definitions and Examples of Triadic Strategies

Strategy	Definitions (Original/Revised)	Examples/Non-examples
1. Establish Dyadic Context	*Original*: Elements of the environment are arranged or rearranged to increase the probability of mutually enjoyable parent-child interactions. *Revised:* Suggestions are made by practitioners only to initially engage or re-engage the caregiver in interactions with the child.	*Examples:* • Practitioner helps the caregiver set up or begin dyadic interactions. • "Show me what that routine looks like." • To caregiver:"What is a game you two like to play?" • To caregiver via child: "Let's show your dad the toy." • To caregiver via child: "Do you wanna get some toys for your mom?" *Non-examples:* • Practitioner instructs the child to bring materials to mom and place them in front of her when mom was already interacting with the child. • Practitioner tells mom to try a new game with the child when the caregiver and child were already interacting with one another.
2. Affirm Parent Competence	*Original*: Developmentally supportive interactions are warmly recognized and expanded upon, as are characteristics of child competence. *Revised*: Developmentally supportive interactions are warmly recognized and commented on by the practitioner.	*Examples:* • "He looks so happy when you play with him in the water." • "I noticed you're doing a great job of giving him his words!" • "Did you realize you were creating another opportunity for Keith to practice walking on different surfaces when he played in the grass?" • To caregiver via child: "I like it when you help me with that, mom." *Non-examples:* • "He's really good at putting the blocks in the hole." • Practitioner follows up with information about toys that the caregiver previously asked about. • "You are so crafty!"

3. Focus Attention	*Original*: Aspects of the interaction are commented upon, expanded, or questioned in order to draw the parent's attention to particular competences or actions in self or child. *Revised*: Aspects of the dyadic interaction are commented upon or questioned in order to draw the caregiver's attention to particular competences, cues, or actions in self or child that may not have been previously recognized or noticed by the caregiver.	*Examples*: • "What do you think she wants to do when she tugs on your hand and makes that sound?" • "Did you hear that? I think he just said 'baba'." • "Oh! He's pushing it out with his tongue. He's saying, 'I don't like that'." • To caregiver via child: "Look, dad, I can make it work." *Non-examples*: • "How does he let you know that he's interested in a new toy?" • To child when dad has already acknowledged child's skill: "Look, dad, I can make it work."
4. Provide Developmental Information	Information about the child's development is given by verbally labeling or interpreting the child's emotional, cognitive, language, and motor abilities within the context of play and interaction. *Note: this definition was not revised.*	Examples: • "Look how well she was able to use her fingers to pick up that tiny piece of lint!" • "Did you see how he was able to remember where it was when you hid it for him?" • "I see that she's using both hands together with this toy now." • To caregiver via child: "I don't like it when you leave because I don't know yet that you will come back." *Non-Examples:* • Facilitator explains to the caregiver how to use a scarf to encourage tracking and reaching while the child is playing by themself with trucks. • "Mommy, help! I can't figure out how to put the block in the hole."

5. Model	*Original*: Dyadic interaction roles are momentarily taken on by the facilitator *Revised*: Dyadic interaction roles are momentarily taken on by the facilitator, while engaging the caregiver's attention.	*Examples*: • Practitioner role plays a strategy with the caregiver. • Practitioner names and describes the steps of the strategy they are modeling while they do it with the child and caregiver. • Practitioner uses a prop (e.g., a doll) to model for a caregiver how to carry out an action with the child while intermittently narrating to the caregiver. *Non-example*: • Practitioner sings songs, practices sounds, or plays a game with the child over the computer without describing their intentions and actions to the caregiver.
6. Suggest	Facilitator provides the parent with a specific suggestion for something to try with the child. *Note: this definition was not revised.*	*Examples*: • "I wonder what would happen if you roll it to her." • "Why don't you try rolling it to her?" • "Let's see what would happen if you roll it to her." • "You can help her hold on to the couch and roll you the ball." *Non-examples*: • "Can you please adjust the camera?" • To child: "Throw the ball!"

The Dyadic Interactions Coding Sheet

The Dyadic Interactions Coding Sheet was used to capture (Appendix D) the occurrence of reciprocal caregiver-child interactions during teleintervention sessions with their participating EIP. This coding sheet came with supplementary information, which provided research assistants with definitions and examples for instances of dyadic interactions, caregiver-practitioner

interactions, practitioner-child interactions, and no interactions. Research assistants used the Dyadic Interactions Coding Sheet to observe and code the entirety of each teleintervention session submitted by EI practitioners.

Coding Dyadic Interactions. Researchers coded teleintervention videos using paper and pencil 10-second partial interval recording (PIR) and the PIWI Dyadic Interactions Sheet to record the occurrence of dyadic interactions. Similar to coding procedures for practitioner behavior, researchers recorded dyadic interactions within a ten-second interval of time by writing the designated code (e.g., D) in the field corresponding with the appropriate ten-second interval of time. If a dyadic interaction lasted beyond the ten-second interval, coders continued to apply the code to all subsequent intervals in which the interaction was present. Researchers calculated codes to indicate the number of intervals in which the dyad engaged in reciprocal interactions with one another across the length of the teleintervention visit. To determine the time spent in dyadic interactions, the total number of intervals with dyadic interactions were divided into the total number of intervals for the session and calculated into percentages. Definitions and examples used for coding dyadic interactions are found in Table 5 and describe verbal, physical, and play interactions commonly found in the data with considerations for children not yet exhibiting joint attention skills with caregivers and for the presence of multiple family members. Similar to the coding procedures for practitioner behavior, coding for this variable began once the practitioner, the caregiver, and the child were present. Intervals were excluded from coding if any of the following criteria were met: (1) the recording was unclear due to issues with technology, (2) the caregiver and child were not present, (3) the practitioner was not present on the screen, and (4) the practitioner and caregiver were addressing administrative issues (e.g., IFSP goals, program placement, and ongoing scheduling.

Table 5

Definitions and Examples of Dyadic Interactions

Type of interaction	Examples	Non-examples of dyadic interaction
Verbal interaction	Caregiver and child talking, singing, and vocalizing together.	Caregiver is talking with the practitioner while the child goes off to play.
Physical interaction	Caregiver holding the child and facing them, helping a child on a playset; caregiver and child dancing together.	Practitioner is talking/singing with the child and child is not focused on the caregiver.
Play interaction	Caregiver and child engaging with an activity, game, or toy together.	Caregiver directs their attention to another person or event.
Interactions for children without joint attention skills	Caregiver and child engaging with an activity, game, or toy together, while the caregiver attends to the child and the activity/toy.	Child is sitting with or next to the caregiver while the caregiver talks to and attends to the practitioner only.
Multiple adults present	Caregiver on Zoom is present with and supporting another adult engaged in a dyadic interaction with the child.	

The Interview Protocol

As is appropriate for an explanatory mixed methods research design, the lead researcher developed the interview protocols for both practitioners and caregivers following the completion of the intervention phase. Broad EI experiences and targeted intervention experiences identified as needing further explanation were considered during development (see Appendices E and F), in addition to the guiding theories of Family-Centered Practice, such as helpgiving, capacity-building, self-efficacy, and empowerment. A strength of single-case design is its applied nature and its consideration of participants' context. This produced questions relevant to data patterns and participants' experiences of the study phases among unique contexts (e.g., families, environment) in addition to what was already learned through understanding the data trend. The lead researcher anticipated that the interview protocol would solicit caregivers' and practitioners'

experiences with service delivery throughout baseline and intervention. Participating caregivers and practitioners answered questions that prompted them to reflect on their role in teleintervention visits, their actions during visits, their perceived benefits and barriers of triadic teleintervention visits, improvements or challenges with triadic service delivery that they experienced during visits, and progress on family and child outcomes. Sample questions included, "Tell me what was challenging about using triadic strategies during teleintervention visits?" and "What changes, if any, did you notice in your practitioner's coaching style over the course of the study?"

Procedures and Data Collection

Data were collected first for the quantitative strand via single-case research design, followed by data collection for the qualitative strand. Following informational and consenting meetings, participating practitioners and families completed the Demographic and EI Experiences Questionnaire. This questionnaire was presented to both caregivers and practitioners prior to the start of baseline data collection in an online format (e.g., Microsoft Word), which they submitted from their homes.

Single Case Design Study & Intervention

The intervention consisted of training and coaching practitioners to deliver family-centered triadic strategies embedded in EI teleintervention sessions with young children with disabilities and their families. Similar to the structure utilized by Fettig et al. (2015), intervention procedures and implementation included baseline (A), intervention (B), and maintenance (C) conditions. The intervention condition (B) consisted of both virtual training and virtual coaching opportunities.

Baseline (A)

During baseline (A), triads conducted weekly teleintervention sessions; practitioner use of strategies and dyadic interactions reflected typical behavior for participants. Caregivers and practitioners were instructed to interact with each other and the participating child as they typically would. Practitioners did not receive any instructions, training, or coaching during this phase. Practitioners uploaded recordings of teleintervention sessions to a confidential storage folder on a weekly basis within two days of the session. Baseline data were collected for at least four sessions, or as soon as data showed stable trends after four sessions were completed (WWC, 2020). During baseline, caregiver and practitioner participants completed the Demographic and EI Experiences Questionnaire for the first time and reported their anticipated home visit schedule for the length of the study for scheduling purposes.

Intervention (B)

Practitioner Training. The first participant triad to demonstrate a stable data pattern was introduced to the intervention. Immediately following baseline and prior to beginning intervention data collection, the lead researcher met individually with EI practitioners via a videoconferencing platform (Zoom) to train practitioners in implementing triadic strategies during teleintervention sessions with families. Each practitioner training consisted of one session lasting approximately 90 minutes. Training components included 1) introduction to the triadic strategies, how they reflect the foundations of family-centered practice in Part C, and connection to recommended practice in EI and ECSE (intro and rationale), 2) thorough description of each strategy, including definitions and illustrative video examples (when available), 3) practice identifying triadic strategy use by practitioners during home visits sessions via session videos, and broad discussion of strategy application to a teleintervention delivery model, 4) opportunities

for behavior rehearsals and feedback opportunities (Fixsen et al., 2005) between the research and practitioner, and 5) brainstorming for practitioners to plan how they will incorporate triadic strategies during service delivery with their participating family, while identifying potential barriers, and 6) closing Q&A for practitioners. A training manual (see Appendix G) was used to guide training across participants and the lead researcher acted as the primary trainer for all participants. Research assistants used a training implementation fidelity checklist to ensure all elements of the training were completed. At the end of training, each EIP received a stipend of $100 to compensate them for their time and efforts.

Following practitioner training, triads continued weekly teleintervention sessions with each other and practitioners were instructed to incorporate the triadic strategies as described during training. The lead researcher had previous experience training preservice teachers to understand, identify, and implement triadic strategies in their work with children and families in EI settings.

Coaching. During the week following training, practitioners received coaching from the lead researcher (referred to henceforth as "coach") to implement triadic strategies during teleintervention sessions with families. Coaching provides opportunities for practitioners to apply newly learned skills to relevant field contexts (Fixsen et al., 2015). The coaching approach used was adapted from the Practice-based Coaching (PBC) framework (Snyder et al., 2015), which aligns with supporting EI practitioners with implementing recommended practices. PBC emphasizes a collaborative relationship between the coach and learner and incorporates shared goals and action planning, focused observation, reflection, and feedback. PBC has been linked to supporting early childhood special education teachers with implementation and continued use of targeted teaching practices (Hemmeter et al., 2016).

Similar to training, coaching took place via a videoconferencing platform (Zoom) and was scheduled at a convenient time for the practitioner. Coaching sessions occurred weekly, between teleintervention sessions, and were approximately thirty to forty-five minutes in length. Each coaching session consisted of the following components: 1) a debrief of the previous teleintervention session and review of the practitioner's action plan (as available), 2) observation of recorded clips from the triad's previous teleintervention session, 3) reflection and feedback opportunities, and 4) action planning. For the observation component of coaching, the coach reviewed the practitioner's most recently submitted teleintervention session recording and created a 2-4 minute clips portraying the practitioner's use of triadic strategies with their participating family (Marturana & Woods, 2012) or potential opportunities for the practitioner to use strategies with the dyad. Clips provided opportunities for shared observation and problem-solving between the coach and practitioner, self-reflection for the practitioner, and coaching feedback. Clips also guided action planning for the practitioner as they considered strategy use with the young child and family during future teleintervention sessions. As with the previous phases, data continued to be collected until it demonstrated a stable trend, targeting a minimum of five teleintervention sessions per triad during the intervention phase, with three consecutive sessions during some point of the phase. All practitioners participated in a minimum of five coaching sessions. If a triad's teleintervention session was canceled, practitioners met briefly with the coach to review their action plan before their next scheduled teleintervention sessions. After the coaching phase, each EIP received a stipend of $250 (approximately $50 per coaching session, including efforts to upload teleintervention sessions) to compensate them for their time and efforts.

Maintenance (C)

Immediately following the coaching phase of the intervention, practitioner coaching was ended, and practitioners were instructed to continue implementing triadic strategies during teleintervention sessions. Coaching support was not provided. Data collection during this phase continued for one or more consecutive sessions with each triad.

Quantitative Data Collection

Recordings of Teleintervention Sessions

EI practitioners submitted weekly video recordings of each teleintervention visit conducted with their participating family throughout the course of baseline, intervention, and maintenance phases. Consistent with EI practice intensity for home visit sessions observed in the literature (Kemp & Turnbull, 2014), teleintervention sessions included in this study occurred weekly, lasting approximately 30-60 minutes per session. Recordings were created using a videoconferencing platform adopted by the practitioner's agency (e.g., Zoom) and uploaded to a confidential online folder within two days of recording. Recorded sessions were used to code for practitioner use of the triadic strategies as well as dyadic interactions. Practitioners were instructed to upload the full teleintervention session for each visit.

Quantitative Data Collector Training

Prior to SCR quantitative data collection, researchers and research assistants were trained to code practitioner-submitted videos of teleintervention sessions for two observational measures: (a) practitioner implementation of triadic strategies and (b) dyadic interactions. Research assistants conducting observational coding were masked to study conditions and phases.

Training for observation of practitioner implementation of triadic strategies incorporated video clips collected from baseline phase data and online teleintervention homevisiting resources (e.g., NCPMI). Research assistants were trained to 90% agreement on each measure before beginning data collection. A study intervention manual guided training procedures and sessions. Training was conducted by the lead researcher with research assistants and included the following steps: (a) the research assistant will read the training manual and coding definitions, (b) the lead researcher reviewed the manual with the research assistant and provided an overview of data collection procedures and measures, (c) the lead researcher and research assistant simultaneously watched video clips, practiced coding videos, and discussed coding disagreements, (d) the lead researcher and research assistant coded additional videos, compared codes, and continued coding until they reached 90% agreement on four consecutive video clips. Once agreement was reached, research assistants began data collection of submitted recordings. Steps C and D were first completed for coding practitioner use of triadic strategies and then repeated for coding of dyadic interactions.

Interobserver Agreement

Research assistants conducted secondary coding to assess Interobserver Agreement (IOA), in compliance with recommended guidelines in SCR design (Kratochwill et al., 2013; Ledford et al., 2019; WWC, 2020). IOA was documented using point-by-point (Kelly, 1977) agreement for 10-second partial interval recording for at least 38% of sessions of each participant triad, for each condition, and for observational coding of both practitioner behavior and dyadic behavior, with a targeted minimum threshold of 85% agreement. If at any point IOA indicated agreement of less than 80%, recalibration occurred for the coder(s) and additional training was provided.

IOA data is first presented here for practitioner behavior, both by participant and overall. Reliability for practitioner behavior reflects agreements regarding which of the six strategies were implemented by a practitioner at any point during the designated 10-second interval and if the practitioner was applying the strategy to the present context or out of context (e.g., a play activity happening in the moment with the child and caregiver or in a conversation with the caregiver about a routine that occurred with the child earlier that day). For Lauren, IOA data were collected for 44% of total sessions and ranged from 90-100% with an overall mean of 95%. For Phoebe, IOA data were collected for 39% of sessions and ranged from 74-88% with a mean of 81%. It is worth noting that due to Phoebe's style of communication and emphasis on the use of reflective questioning and indirect statements, coding for this practitioner's behavior was a focus of coding training and meetings. For Beau, IOA were collected for 50% of sessions and ranged in agreement from 80-83%, with a mean of 81%. This practitioner also utilized questioning and an indirect style of communication that warranted greater discussion during behavioral coding meetings. For Flora, IOA data were collected for 47% of sessions and ranged from 78-98% with a mean of 90%. The overall mean IOA for practitioner behavior was 87% (range=74-100%) and agreement data were collected for 44% of sessions. As stated, recalibration training occurred with all data coders when IOA data for this participant demonstrated levels below 80%.

IOA data for dyadic behavior reflect agreements between coders regarding the occurrence of reciprocal caregiver-child interactions at any point during a 10-second interval. For Dyad 1, IOA data were collected for 44% of total sessions and ranged from 90-91% with an overall mean of 91%. For Dyad 2, IOA data were also collected for 44% with a mean of 89% (range=77-97%). IOA data were collected for 43% of Dyad 3's sessions and ranged in agreement

from 84-94%, with a mean of 85%. Finally, IOA data for Dyad 4 were collected for 47% of sessions and ranged from 85-92% with a mean of 88%. The overall mean IOA for dyadic behavior was 88% (range=74-95%) and reliability data were collected for 46% of sessions.

Training and Coaching Fidelity

Training fidelity was measured using the 21-item training protocol (see Appendix G) to ensure that training was delivered consistently across practitioners. Checklists were designed to indicate if the trainer did (yes) or did not (no) complete each item, with additional space available for raters to write notes. Coaching fidelity was assessed via a 16-component fidelity checklist (see Appendix G), used to ensure that the coach addressed all coaching components within each session. Checklists indicated that a coach did (yes) or did not (no) address a component, as well as if that component was not applicable in that session (N/A). Fidelity checklists differed depending on the components necessary for each unique session (e.g., the coach and participant will not review a previous clip during their first session). All training and coaching fidelity checklists were completed by a member of the research team who did not deliver training or coaching. The lead researcher calculated and recorded fidelity scores.

To conduct fidelity ratings, research assistants reviewed recordings of practitioner training and coaching sessions conducted via Zoom. Fidelity was assessed for each training and coaching session, including a total of four training sessions and 25 coaching sessions. All training sessions were conducted at 100% fidelity to the training intervention. Nine coaching sessions were conducted for Lauren at 100% fidelity to the coaching intervention and six sessions were conducted for Phoebe at 99% fidelity to the coaching intervention. Five sessions were conducted for both Beau and Flora at 99% and 100% fidelity, respectively. Overall coaching fidelity was determined to be 100%.

Quantitative Data Analysis

Data analyzed from the SCR procedures addressed the first two research questions of the study: (a) To what extent is there a functional relation between virtual professional training and coaching opportunities and EI service practitioners' use of triadic parent coaching strategies? (b) To what extent does practitioners' implementation of triadic strategies affect dyadic interactions?

Quantitative data analysis from the SCR phase of the study was guided by the What Works Clearinghouse Procedures Handbook (WWC, 2020). Visual analysis was used to inform in-vivo research decisions (e.g., advancing participants to intervention conditions or making contextual adjustments), to make adaptations to the conditions as needed while maintaining experimental control (Ledford et al., 2019), and to complement WWC standards. Visual analysis of graphed data for (a) practitioner behavior and (b) dyadic interactions included vertical analysis for evidence that baseline data paths changed when intervention phases were introduced (Wolfe et al., 2019). It also examined *level*, *trend*, *immediacy of change*, *stability*, *variability*, and *overlap* within and across conditions for each EIP participant (Barton et al., 2018) to investigate the effectiveness of training and coaching on (a) EIPs' implementation of family-centered triadic strategies during teleintervention sessions with young children and their families and (b) the occurrence of dyadic interactions. Components of visual analysis serve different purposes. According to Kratochwill et al. (2013), *level* refers to the overall average of data points within a phase, *trend* refers to the slope of the data, *immediacy of change* refers to the "change in level between the last three data points in one phase and the first three data points of the next," (p. 31), *variability* demonstrates the range, variance, or standard deviation of the visual data line, and *overlap* generally refers to the proportion or number of data points that overlap from one phase

to the next. *Stability* refers to the similarity of data points in a given experimental phase (Wolery & Harris, 1982).

We hypothesized that EI practitioners would infrequently implement triadic strategies at baseline. Practitioners were expected to increase triadic strategy use when training and coaching were introduced. When coaching was completed for each participant, strategy use was expected to maintain levels similar to the intervention phase or to decrease slightly. Further, we hypothesized that time spent by the caregiver-child dyad in reciprocal interaction would increase during the intervention and maintenance phases compared to baseline.

Qualitative Data Collection

Interviews

Qualitative data collection consisted of one semi-structured interview conducted with each caregiver and practitioner participant after quantitative data collection concluded. Eight interviews were conducted in total. One-on-one interviews were conducted by the lead researcher via Zoom using the revised interview protocol. During the interviews, definitions and examples of the triadic strategies and triad-specific findings from the quantitative strand were shared with their respective triad participants during interviews to facilitate discussion and gather participant perspectives regarding intervention efficacy and components. Interviews were approximately 45 to 60 minutes in length, were recorded using Zoom, and transcribed. Interviews occurred within two to three weeks of the final observed teleintevention session between the practitioner and the family. Following the interview, participants received a $100 stipend to compensate them for their time and effort.

In accordance with an explanatory mixed methods design, data analysis began with data from the quantitative SCR portion of the study, which, at its completion, informed the

development and final revision of the qualitative follow-up interviews. Data from the PIEI prompt were also included in the final interview guides. A draft interview guide based on our conceptual framing was created preceding the SCR portion of the study and revised once SCR data collection was completed. For the revision of data-based interview items, relevant quantitative findings were identified, corresponding interview items were finalized, and the rationale connecting quantitative results to the interview item was determined (Table 6). See Appendices E and F for interview guides.

Table 6

Interview Guide Items Informed by Quantitative and Questionnaire Results

Relevant guide	Relevant quantitative findings	Interview item(s)	Item rationale
Practitioner interview guide	• The intervention was functionally related to a consistent increase in practitioners' level of implementation of triadic strategies for most practitioners; level changes between baseline and intervention were modest.	• What challenges or barriers did you experience with using triadic strategies?	• Elicit practitioner experiences that inform low levels of behavior change across phases.
Practitioner interview guide	• Experimental control was initially demonstrated across practitioners as they each experienced an immediate (though slight) change in level with introduction of the intervention	• What went really well for you with using triadic strategies during sessions? • [Probe] Which of the strategies did you find to be most useful in your sessions?	• Elicit practitioner experiences that inform experimental control with implementation of triadic strategies.

Practitioner interview guide	• Individual survey results; varied by participant	• You indicated_____ (e.g., "I prefer to involve families in a way where they can continue to do the interventions without my ongoing assistance"). Walk me through how you do this.	• Elicit practitioner understanding of implementation of capacity-building practices during sessions.
Practitioner interview guide	• Introduction of the intervention was functionally related to increases in time spent in dyadic interactions by dyads, though this relation was modest in some cases.	• Tell me about your experience with trying to support dyadic interactions during sessions.	• Elicit practitioner experiences that inform low to moderate levels of dyad behavior change across phases.
Caregiver interview guide	• The intervention was functionally related to a consistent increase in practitioners' level of implementation of triadic strategies for most practitioners; level changes between baseline and intervention were modest.	• Reflect on your sessions with [practitioner] since [training date]. Tell me about the changes you've noticed in your practitioner's coaching style since that time.	• Elicit caregiver experiences that inform low levels of practitioner behavior change across phases.
Caregiver interview guide	• Introduction of the intervention was functionally related to increases in time spent in dyadic interactions by dyads, though this relation was modest in some cases.	• Tell me what your practitioner does during your sessions that really helps you to support your child's development	• Elicit caregiver experiences that inform low to moderate levels of dyad behavior change across phases

Caregiver interview guide	• Individual survey results; varied by participant	• You indicated:_____ (e.g., “The service provider involves me in a way where I can continue to do the interventions without the provider’s ongoing assistance”). Walk me through how they do this.	• Elicit caregiver understanding of implementation of capacity-building practices during sessions.

Qualitative and Mixed Data Analysis

This project's qualitative data analysis served to explain and expand upon previous quantitative data results from the SCRD data strand. In this way, data mixing occurred at the beginning of qualitative data collection and continued throughout qualitative analysis. For this project, interview data were used to fulfill the "explanatory" component and comprised the focus of qualitative data analysis. Qualitative analysis helped to address the last three research questions guiding this project: (a) What are practitioner experiences with virtual professional development training and coaching in a triadic, family-centered approach to service delivery? (b) What are practitioner and family experiences with a triadic approach to EI service delivery in a teleintervention setting? (c) What factors influence the implementation of triadic strategies during EI teleintervention service delivery?

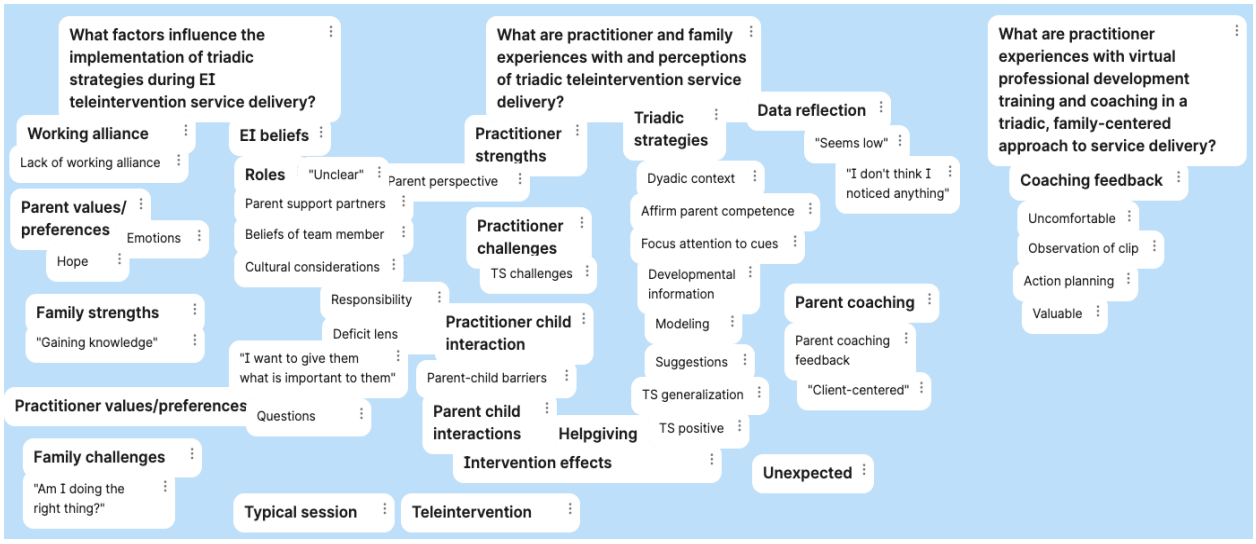
Qualitative data analysis began with listening to recordings of and reading transcriptions of interviews for understanding before reviewing transcriptions to complete the coding process. The lead researcher edited transcriptions for corrections (e.g., missing timestamps, misspelled words, dropped words), and all content and labels for transcripts were de-identified. Edited and de-identified transcripts were then uploaded into Dedoose (2014) for shared coding. All transcripts were coded by both the lead researcher and one collaborative coder, a research

scientist with a PhD. Both the lead researcher and the collaborative coder had previous experience with qualitative data collection and analysis. Thematic analysis of qualitative data was conducted through an ongoing, cyclical, and iterative process of coding, code organization, memoing, and interpreting themes, similar to what is described by Braun and Clarke (2008).

The first step in the coding process utilized open-coding of select transcripts, allowing patterns to surface (Coffey & Atkinson, 1996) that repeated across interviews and within each interview, eliciting primarily descriptive and structural codes (Saldaña, 2015). Gathering descriptive codes allowed coders to capture multiple topics addressed in the data (e.g., "Teleintervention", "Typical sessions"), while structural codes elicited data that addressed content and concepts across topics (e.g., "Data reflection", "Caregiver values and preferences"). An initial codebook was created, comprised of codes developed through both inductive and deductive approaches. Codes gathered during the initial open-coding process were included, in addition to codes reflecting relevant themes from Family-Centered Practice and select foundational theoretical elements pertaining to Family-Centered Practice, such as helpgiving, capacity-building, self-efficacy, and empowerment (see Chapter 2). Deductive, theoretical-based codes included "EI beliefs" and "Helpgiving." Qualitative coders met weekly throughout data analysis to discuss code definitions, applications, and disagreements. Codes were regularly added as novel concepts or topics surfaced in the data, while others were redefined to provide clarity. Multiple in vivo codes were added, such as "Gaining knowledge."

Figure 2

Qualitative Code Mapping by Research Questions



To initiate second round coding, the lead researcher and collaborative coder drafted retrospective, analytical meta-memos (Saldaña, 2015) to critically consider salient codes, cohesive themes, and potential relationships between themes. These memos were prompted by the following guiding concepts: 1) participants' perspectives of the usefulness of the triadic coaching strategies (overall and considering specific codes), 2) participant strengths, challenges, and values that contributed to their experience of caregiver coaching, and 3) participant experiences (within and outside of sessions) that contributed to their experience of caregiver coaching. Following memoing, the lead researcher engaged in code mapping (see Figure 2). Codes were visually presented for coders to collaboratively expand on and explain quantitative data results as relevant to the project research questions. During this process, the lead researcher collapsed, expanded, and thematically organized codes to better align with the foundational concepts of "family-centered, capacity-building practice," "participant experiences and perspectives," and "participant factors." Additional operational model diagrams (see Figure 3)

(Saldaña, 2015) were created to organize identified themes, their relationships, and their connection to the research questions.

Figure 3

Thematic Mapping

Further analysis and reflection on themes and thematic relationships led to the creation of initial claims and identification of both supportive and disconfirming evidence from the data. The lead researcher continued to meet with the collaborative coder monthly throughout second round coding to critically analyze proposed claims and their usefulness in explaining quantitative results from the SCRD strand.

Steps were taken throughout qualitative and mixed data analysis to strengthen its credibility (Brantlinger et al., 2005). Interview transcripts were triangulated to compare and cross-check emergent themes both across and within participants and seek corroboration with quantitative data results (Fetters, 2020). Transcripts were also triangulated among participating triads. Coding and analysis were conducted collaboratively throughout, with the lead researcher and collaborative coder engaging in ongoing "shop-talking" of the data (Patton, 2015). During this process, coders engaged in an ongoing cycle of discussing questions, disagreements, and wonderings about the data during weekly and bi-weekly coding meetings. Engaging in ongoing meetings allowed us to regularly discuss the data, our codes, and our interpretations of claims. This approach aligned with our view of qualitative analysis as an ongoing process of interpretation, influenced by our personal and professional backgrounds and experiences. Additionally, rich, thick descriptions are provided throughout the paper with corresponding interview quotes to support data analysis and findings.

Member checks were conducted with participants to confirm or disconfirm interpretations and develop the validity of findings (Merriam & Tisdell, 2015). Member checking was conducted through Synthesized Member Checking and followed the protocol as outlined by Birt et al. (2016). Synthesized Member Checking is suggested to be an accessible way for participants to review preliminary data (Birt et al., 2016). After completing qualitative data analysis as described above, the lead researcher prepared preliminary claims and emergent themes into synthesized summaries, which were presented to participants in the form of a brief Qualtrics survey. Two summaries were created: one reflecting caregiver-specific claims (e.g., "I appreciate when my practitioner is genuinely supportive and encouraging and points out what I'm doing really well") and one reflecting practitioner-relevant claims (e.g., "I felt supported by the

coaching process and believed that it helped me incorporate the triadic strategies during my sessions with families"). Six claims were shared with caregivers and ten claims were shared with practitioners, with accompanying prompts, such as "Does this match your experience?" “Do you want to change anything about this statement?" or "Do you want to add anything?" Participants were invited to share their responses and submit them to the researcher to influence the interpretation of emergent themes. Responses were gathered and integrated into the qualitative findings. For example, details were added to support qualitative findings regarding practitioner experiences with strategy implementation. Also, when asked to consider this statement: "I am unclear about what my role is and what my practitioner's role is during sessions,” most caregivers expressed clarity with their respective roles. Initial findings of caregiver perspectives of roles and expectations were modified to reflect their SMC responses.

Researcher Positionality

As stated, the two members of our qualitative analysis research team included the lead researcher and one collaborative coder. Throughout analysis, the lead researcher was a doctoral student, and the collaborative coder had recently graduated from the same College within the University with her Ph.D. Both specialized in Special Education with experience in both Single Case and Qualitative research. In addition, both had worked professionally as service providers in EI and Early Childhood Special Education, identified as white females, and have school-aged children. In our clinical and research work, we share a dedication to supporting educational professionals through professional development opportunities and strengthening family-professional partnerships. Despite our similarities, our varied experiences in service provision (the lead researcher primarily as a special educator in EI and ECSE, the collaborative coder in behavioral approaches in EI) afforded thoughtful and critical conversations about the data and

how our own experiences influenced our interpretations. As a result, we believe that our analysis partnership supported a thorough and reflective analytical process.

Data Merging and Interpretation

As stated, findings from both the quantitative and qualitative phases of the study were mixed to provide multiple findings. Quantitative results suggest the effect of virtual training and coaching on practitioners' implementation of triadic strategies and time spent in dyadic interactions during teleintervention sessions. Qualitative findings present the mixing of quantitative data with qualitative data collection procedures and analysis to explain practitioners' and caregivers' experiences with various intervention components and implementation of strategies. They also expand on the contextual factors that affected these experiences. Mixed methods analysis capitalized on these two data sources, utilizing an approach created by Moran-Ellis, et al. (2006) called "following a thread." Key themes from the literature and initial SCR analysis (e.g., family-centered, capacity-building practices and strategy implementation) were threaded through qualitative data collection and analysis (e.g., participant experiences with practices and their implementation), and finally threaded back through quantitative results to provide a more expansive explanation and integrate the two strands. Mixed methods findings present meta-inferences derived from the merging of quantitative and qualitative results. Thus, qualitative findings present data mixing and explanation of quantitative findings while mixed methods findings interpret merged results.

CHAPTER 4

Results

Data from the quantitative strand, questionnaire, and qualitative strand are reported either in isolation, mixed, or both, as appropriate. The quantitative and qualitative strands are presented via a contiguous approach (Fetters, 2020), with qualitative findings following quantitative results and mixed methods findings presented at the end. Quantitative data will describe two variables: 1) practitioner behavior (as evidenced by practitioner implementation of triadic coaching strategies) and 2) dyad behavior (as evidenced by the occurrence of caregiver-child interactions). Both quantitative variables will be described as the percentage of time that participants engaged in select behaviors during each teleintervention session, with corresponding figures for visual analysis. Qualitative findings will then seek to "explain" quantitative results by reporting data that addresses multiple themes representing participant experiences, perspectives, and factors. Finally, mixed methods findings will present an integration of quantitative and qualitative findings, both broadly and by triad.

Practitioner Behavior

Data collected for practitioner behavior reflected practitioners' total use of the six triadic caregiver coaching strategies during teleintervention sessions with their participating family: establish dyadic context (ED), affirm parent competence (AP), focus attention (FA), provide developmental information (PD), modeling (MO), and suggest (SU) (see Figure 4). Practitioner behavior was our primary dependent variable for this study and suggested practitioners' implementation fidelity of triadic strategies. A brief description of strategy use by phase is provided for each practitioner following interpretation of their visual analysis results.

Lauren

Lauren was the only practitioner to begin baseline sessions with her participating family on week one and four sessions were recorded for this phase. She exhibited low, stable levels of implementation of triadic caregiver coaching strategies during four consecutive baseline teleintervention sessions. Of the four practitioners, her data reflected the lowest baseline level. Variability remained low as well, with strategy use ranging from 2%-9% of the total session time.

Following the introduction of training and coaching, Lauren demonstrated an immediate but slight bump up in implementation level, though this quickly returned to a lower level and remained somewhat low throughout the intervention phase (range = 7-26). Lauren's implementation of strategies followed a predictable and stable accelerating and decelerating trend, with multiple missing data points scattered throughout the intervention phase (weeks seven, ten, thirteen, fifteen, sixteen, and eighteen). Despite the presence of consistent baseline data, there were no more than two consecutive data points at any point in Lauren's intervention phase, with a two-week pause noted during data collection for this triad. Her level of implementation maintained moderate variability following introduction of training and coaching, with multiple data points overlapping with baseline phase. Of the ten teleintervention sessions from Lauren's intervention phase, three overlapped with baseline levels of implementation. A maintenance phase was not introduced for this practitioner, as this triad did not participate in three or more consecutive teleintervention sessions at any time during the intervention phase. Compared to the other triads, this triad had the greatest number of missing data sessions throughout the intervention phase.

For Lauren, the most frequently used strategy during baseline was *Suggest* (62% of strategy use) (see Table 7), and this continued to be her most used strategy during the intervention phase (61% of strategy use). Increases in her use of *Focus Attention* and *Provide Developmental Information* were observed in intervention compared to baseline (14% to 21% and 0 to 6%, respectively).

Table 7

Lauren's Use of Strategies by Phase

	ED	AP	FA	PD	MO	SU
Baseline	19	14	14	0	3	62
Intervention	5	10	21	6	0	61

Note. ED = Establish Dyadic Context; AP = Affirm Parent Competence; FA = Focus Attention; PD = Provide Developmental Information; MO = Modeling; SU = Suggest. Data represent percent of overall strategy use.

Phoebe

Five baseline sessions were recorded for Phoebe. During baseline, Phoebe exhibited relatively low levels of implementation of triadic caregiver coaching strategies (range = 6-24), though with more variability and slightly higher levels than Lauren. Most of this variability occurred in the first three sessions of the baseline phase (weeks two through four), with her highest strategy use during weeks three, five, and six. As a result of lower implementation on week four, her data exhibit a slight accelerating trend for the final three sessions of the baseline phase.

After introducing the training and coaching intervention, Phoebe's strategy use increased compared to baseline data, ranging from 27% to 35% of session time. The variability in her implementation of coaching strategies remained low and stable throughout this phase (eight points), with an overall flat trend. This triad missed one session on week ten, with otherwise consistent attendance throughout the intervention phase. Despite the overall minimal change in level between baseline and intervention phases, this practitioner had no overlapping data points with the baseline phase. In total, eight intervention sessions were recorded for Phoebe.

Her strategy use remained stable with low variability during the five recorded teleintervention sessions for the maintenance phase, with a slight decelerating trend for the first three weeks. Phoebe's level of implementation was slightly lower during maintenance (range = 22-28%) compared to the intervention phase. While her strategy use was minimally higher in maintenance than baseline, these two phases had three overlapping data points. Additionally, this triad missed one session just prior to the final session of the maintenance phase.

Phoebe's most frequently used triadic strategy during baseline was *Suggest* (57% of strategy use) (see Table 8), followed by *Focus Attention*, at 34% of strategy use. During intervention, her use of *Suggest* decreased (42% of strategy use), while *Affirm Parent Competence* and *Focus Attention* both increased compared to baseline (10% to 15% and 34% to 37%, respectively). Throughout maintenance, she continued to increase her use of *Affirm Parent Competence* (23%) and *Focus Attention* (51%), while decreasing her use of *Suggest* (25%).

Table 8

Phoebe's Use of Strategies by Phase

	ED	AP	FA	PD	MO	SU
Baseline	8	10	34	21	3	57
Intervention	2	15	37	7	1	42
Maintenance	2	23	51	6	0	25

Note. ED = Establish Dyadic Context; AP = Affirm Parent Competence; FA = Focus Attention; PD = Provide Developmental Information; MO = Modeling; SU = Suggest. Data represent percent of overall strategy use.

Beau

Beau's baseline phase consisted of seven recorded teleintervention sessions. This practitioner demonstrated slightly higher baseline levels of strategy implementation (range = 14-34) compared to both Practitioners 1 and 2. Variability remained low overall during baseline, with one notably elevated data point on week 4. Following a missed session during week 5, Beau showed a stable and slightly decelerating trend line for the final four consecutive weeks of baseline data collection.

With the introduction of training and coaching, Beau exhibited an immediate, though modest, increase in their use of coaching strategies with their participating family (14% of session time for the final baseline data point compared to 25% of session time for the first intervention phase data point). They maintained a slightly higher level of strategy use throughout this phase compared to baseline, with a range of 25% to 31%. Beau's intervention phase included six recorded teleintervention sessions. The lowest data points in their intervention phase occurred after missing two weeks of teleintervention sessions with their participating family on weeks 14

and 15. Overall, their use of coaching strategies remained stable, with a somewhat flat trend line throughout the intervention phase. Overlap with baseline data was minimal, though one baseline data point did overlap with all intervention data.

Beau had only one teleintervention session with their participating family during the maintenance phase, during which their implementation of triadic strategies was in range with their intervention sessions (29 points). Thus, due to limited maintenance data for this practitioner, level, trend, stability, and variability cannot be determined.

During baseline, Beau's most used strategy was PD (37% of strategy use) (see Table 9), followed by FA and SU (each 31%). During intervention, their use of PD decreased to 15% and SU decreased to 28%, while AP and FA use were both increased (15% and 44%, respectively). During their single maintenance session, Beau favored FA (62%), while the use of PD and SE continued to decrease (4% and 26%, respectively).

Table 9

Beau's Use of Strategies by Phase

	ED	AP	FA	PD	MO	SU
Baseline	0	7	31	37	1	31
Intervention	1	15	44	15	1	28
Maintenance	0	8	62	4	0	26

Note. ED = Establish Dyadic Context; AP = Affirm Parent Competence; FA = Focus Attention; PD = Provide Developmental Information; MO = Modeling; SU = Suggest. Data represent percent of overall strategy use.

Flora

Flora demonstrated baseline levels of triadic caregiver coaching strategies similar to Beau, though with slightly greater variability (range = 14-29) and more missed sessions (weeks 6, 8, and 11) with her participating family. This resulted in a longer and somewhat unstable baseline phase, beginning with four consecutive teleintervention sessions and ending with two consecutive sessions before being introduced to training and coaching. At week 12, Flora had one baseline session that exhibited a relatively higher use of caregiver coaching strategies (37% of session time) than all other baseline sessions and most intervention phase sessions. Her strategy use dropped immediately the following week to the lowest baseline level (14% of session time). Flora's baseline included nine recorded teleintervention sessions; this was the last practitioner introduced to the intervention.

With the introduction of virtual training and coaching, Flora's level of triadic strategy implementation immediately increased 15% from the final baseline session. She maintained a similar, but minimally higher, level of strategy implementation as compared to baseline, with a range of 25%-39%, and multiple overlapping data points. Flora demonstrated her highest use of strategies on the final week of the intervention phase and overall low variability. Her triad participated in six consecutive intervention sessions together during this phase before moving into maintenance.

During maintenance, Flora participated in two consecutive sessions with her participating family, demonstrating a similar level as the intervention phase (range = 27-36), minimal variability, and data points that overlapped with the two previous phases.

Flora's most used strategy during baseline was SU (see Table 10), at 65% of strategy use, followed by FA (21%). She increased her use of FA significantly during the intervention phase

to 51%, while strongly decreasing her use of SU (43%). Finally, during maintenance, Flora increased her use of both AP (15%) and SU (59%), while decreasing her use of all other strategies compared to intervention.

Table 10

Flora's Use of Strategies by Phase

	ED	AP	FA	PD	MO	SU
Baseline	2	8	21	9	1	65
Intervention	2	9	51	1	0	43
Maintenance	0	15	31	0	0	59

Note. ED = Establish Dyadic Context; AP = Affirm Parent Competence; FA = Focus Attention; PD = Provide Developmental Information; MO = Modeling; SU = Suggest. Data represent percent of overall strategy use.

Overall Practitioner Behavior

Across all four practitioners, baseline levels of implementation of triadic strategy use were low to moderate with an overall range of 1%-37%. While most baseline data points remained below 30%, there were two data points that did not: on Week 4 for Beau and Week 12 for Flora. Otherwise, variability remained low overall across practitioners with overall stable trends.

When training and coaching were introduced in the intervention phase, all practitioners demonstrated a slight increase in their level of triadic strategy use and maintained a minimally higher overall level of strategy use throughout as compared to baseline. The training and coaching intervention was functionally related to a consistent and reliable increase in

practitioners' implementation level of triadic caregiver coaching strategies for Practitioners 2, 3, and 4, though level changes between baseline and intervention were modest. Considering Lauren's overall low and unstable (due to missed sessions) data line, we could not determine a functional relation. Additionally, experimental control was initially demonstrated across practitioners as they each experienced an immediate (though slight) change in level with the introduction of the intervention, with little to no increase in the level of subsequent tiers until intervention was introduced. Due to inadequate data collected for maintenance phases across practitioners, we could not determine if a functional relation between the intervention and practitioner behavior was maintained.

Dyadic Interactions

Data collected for dyadic behavior reflected the percentage of time the caregiver-child dyad was engaged in reciprocal interactions during teleintervention sessions with their EI practitioner (see Figure 4). Examples of dyadic interaction included talking or vocalizing together, interacting with a toy together, or exchanging eye contact. Dyadic behavior was our secondary dependent variable and was considered to be influenced by practitioner use of triadic caregiver coaching strategies.

Dyad 1

Dyad 1 demonstrated somewhat variable dyadic interactions during baseline, with their greatest time spent in interaction occurring the final day of the baseline phase (week 4). They maintained an overall low range, especially for the first three weeks of data collection when their time spent in interactions remained below 20% of session time (range = 12-28). Correspondingly, they exhibited an initial flat trend with a slight acceleration into the proceeding phase.

With the introduction of training and coaching for their practitioner, Dyad 1 continued an accelerating trend up to their third intervention session on week eight and overall exhibited high variability in their engagement in dyadic interactions across intervention sessions. Similar to their practitioner's level of strategy implementation, Dyad 1 exhibited an accelerating and decelerating trend of dyadic interactions through Week 12. However, the direction of their trend lines ran counter to that of their practitioner, such that as their practitioner's strategy use increased, the dyad's time spent in dyadic interactions decreased. This rising and falling trend was punctuated by their lowest dyadic interactions on Week 14, followed by their highest occurrence of dyadic interactions on weeks 17 (17% of session time) and 19 (60% of session time). On the last day of the intervention phase, their time spent in dyadic interactions fell back down to a level similar to the first six weeks of this phase. Despite high variability and low stability (also due to missed sessions), this dyad exhibited higher levels of time spent in dyadic interactions during intervention sessions than baseline, with points overlapping with baseline. As mentioned previously, this triad did not enter a maintenance phase for this study due to a high number of missed teleintervention sessions.

Dyad 2

Dyad 2's session time spent in dyadic interactions maintained a low level throughout five consecutive baseline sessions (range = 11-19). Baseline levels of dyadic interactions also exhibited minimal variability and a stable trend line that was initially flat before decelerating slightly through the final three weeks of baseline data collection.

Session time spent in dyadic interactions for Dyad 2 did not demonstrate immediate change and remained at a low level for the first two sessions of the intervention phase following the introduction of training and coaching for their practitioner. At week nine, their time spent in

dyadic interaction increased sharply to its highest level (42% of session time) and continued with moderate variability throughout the remainder of intervention. This triad missed their teleintervention session on week ten, after which time spent in dyadic interactions by Dyad 2 dropped from the previous week's level, continuing to rise and fall until week 15. Their time spent in dyadic interaction was observed to be at a higher level (range = 6-42) during intervention compared to baseline. While they had three data points overlapping with baseline (weeks 7, 8, and 13), they also exhibited their greatest time spent in dyadic interactions during these days (42% on week 9; 40% on week 12; 25% on week 14).

This triad experienced the longest maintenance phase of all triads in the study, consisting of four consecutive data points, one missed session, and one final non-consecutive data point. Time spent in dyadic interactions continued to show moderate variability throughout the maintenance phase, similar to intervention, and with no apparent or stable trend line. Despite this, Dyad 2's time spent in dyadic interaction was observed to be at a slightly higher level in maintenance (range = 2-36) than baseline, though lower than intervention, and with a slight drop in level from the last session of intervention to the first session of maintenance.

Dyad 3

Data presented for Dyad 3 shows a stable and overall slight decelerating trend throughout baseline, similar to the trend of their practitioner's use of triadic strategies. This minimally downward trend began through the initial three consecutive sessions and continued with four consecutive sessions following a missed session on week five. Dyad 3's time spent in dyadic interactions demonstrated low variability during baseline and was observed to maintain a level minimally higher (range = 13-29) compared to Dyad 2.

With the introduction of training and coaching for their practitioner, Dyad 3 experienced an immediate change in their time spent in dyadic interactions, increasing from 20% of session time for the last baseline session to 40% of session time for the first intervention session. Throughout intervention, Dyad 3's time spent in dyadic interactions maintained a higher level (range = 31-58) compared to baseline with no points overlapping with baseline. This high, flat level was moderately variable and showed a potentially accelerating trend for the last two intervention phase sessions, despite a two-week break from sessions on weeks 14 and 15. Similar to baseline, the dyad's time spent in dyadic interactions during the intervention phase corresponded slightly to a modest increase in the practitioner's use of triadic strategies.

Dyad 3 participated in only one session with their practitioner during maintenance, precluding the ability to determine trend, variability, or stability for this phase. However, with the removal of practitioner coaching, the dyad's time spent in dyadic interactions during this final session was observed to immediately drop down below intervention levels, similar to baseline values.

Dyad 4

Dyad 4 engaged in relatively high levels of time spent in dyadic interactions throughout baseline (range = 26-58) compared to all baseline, intervention, and maintenance phases of the three other triads. They were also observed to have moderate variability and several missing baseline sessions (weeks six, eight, and eleven) with their practitioner. Dyad 4's baseline data suggests an overall flat trend, with a slight deceleration from weeks four to ten and a converse acceleration occurring weeks ten to thirteen.

The time spent in dyadic interaction for Dyad 4 during their first intervention session nearly matched the final baseline session, demonstrating no immediate change with the

introduction of the training and coaching intervention to their practitioner. Instead, Dyad 4 experienced a decrease in time spent in dyadic interactions during sessions at the beginning of this phase during weeks 15 and 16. Correspondingly, these first three intervention sessions (Weeks 14-16) overlapped with baseline values. However, Dyad 4 demonstrated a significant increase in time spent in dyadic interactions in week 17 and maintained this relatively high level of dyadic interactions for the remaining two sessions in the intervention phase. This Dyad demonstrated moderately high variability with their time spent in dyadic interactions throughout intervention (range = 35-75) and a minimally decelerating downward trend for their final three intervention sessions.

Dyad 4 participated in a total of two maintenance sessions with their practitioner. During these two sessions, the dyad experienced a slight drop in their level of time spent in dyadic interactions, overlapping with the two highest baseline data points. There was no variability in time spent in dyadic interactions between these two sessions and no immediate change in level compared to the final intervention sessions.

Overall Dyad Interaction

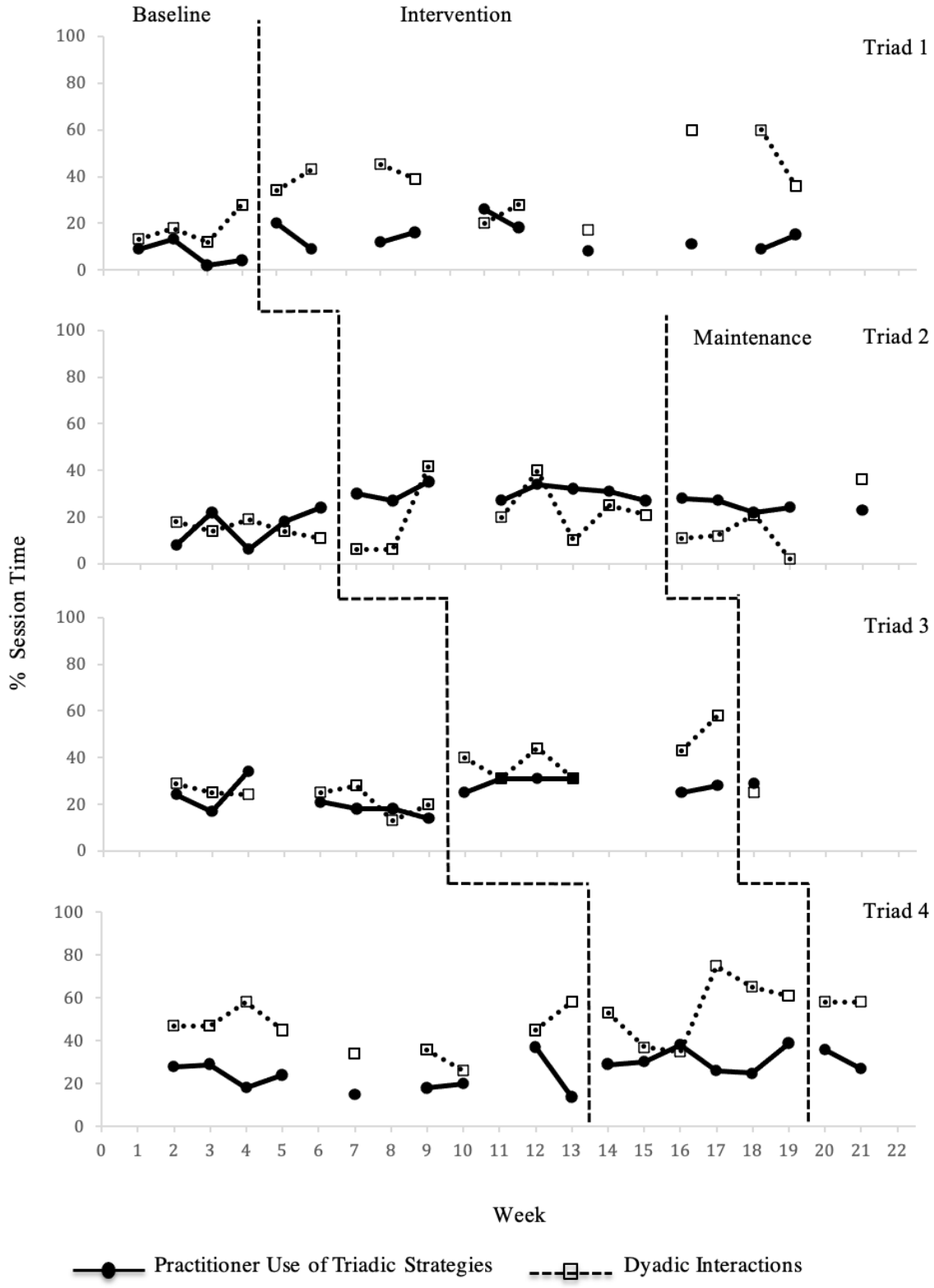
Dyads varied in their time spent in dyadic interactions during baseline, ranging from low variability and a stable flat (Dyad 2) or downward trend (Dyad 3) to modest variability (Dyad 1) or a moderately variable and unstable data line (Dyad 4). For Dyads 1-3, time spent in dyadic interaction remained below 30% of session time during baseline, dropping as low as 11% of session time for Dyad 2 (Week 6). Baseline levels of time spent in dyadic interaction were observed to be higher for Dyad 4.

Overall, the introduction of practitioner training and coaching was functionally related to increases in time spent in dyadic interactions by dyads, though this relation was modest in some

cases. For instance, Dyads 1, 2, and 4 demonstrated consistently higher levels of time spent in dyadic interaction during the intervention phase compared to baseline levels, though they also exhibited minimal to moderate overlapping baseline data points. An increasing change in level was more clearly detected for Dyad 3 throughout the intervention phase. Experimental control for the secondary dependent variable of Dyadic Behavior was not well-established across dyads, although Dyad 3 did demonstrate an immediate and marked change in level with the introduction of the intervention. For most of the dyads, increases in time spent in dyadic interactions during sessions with practitioners occurred gradually. As seen in Figure 4, Dyad 2 and Dyad 4 first exhibited notable shifts in time spent in dyadic interactions two to three weeks after practitioners were introduced to the intervention, on weeks 9 (for Dyad 2) and week 17 (for Dyad 4). Dyad 1 saw this increase much later compared to when their practitioner was introduced to the intervention, at week 17. While these increases in time spent in dyadic interactions do not immediately follow corresponding introductions to the intervention, they also do not align with phase changes for subsequent tiers.

Figure 4

Practitioner and Dyad Behaviors



Demographic and EI Experiences Questionnaire Responses

Practitioners and caregivers responded to multiple items in this questionnaire at one or two timepoints (see Table 11). The comfort with home context response was completed by practitioners only at the beginning of the study, prior to baseline. The comfort with teleintervention item, working alliance item, and PIEI prompt were completed at two points in the study: initial responses were completed just prior to baseline and follow-up responses were completed after quantitative data collection. Responses were provided on a rating scale of 1-5 with 5 representing the highest score for each item.

Table 11

Responses to Initial and Follow-up Questionnaires

	Home contexts	Teleintervention		Working alliance		PIEI prompt	
	Initial	Initial	Follow-up	Initial	Follow-up	Initial	Follow-up
Lauren	5	5	4	5	5	5	5
Phoebe	4	3	5	5	4	5(2)	5
Beau	1	3.5	4	4.5	5	5	5
Flora	4	3	4	2	3	5	5
Jannie	--	5	5	5	5	4	4
Jane	--	5	5	5	5	5	5
Sharon	--	--	5	--	5	--	5
Taryn	--	4	5	4	5	5	4

Note. "Home contexts" = comfort with home visits; "Teleintervention" = comfort with teleintervention services

Each practitioner completed the questionnaire at both timepoints, resulting in eight completed questionnaires. Of the four caregiver participants, three completed the initial questionnaires, and four completed the follow-up questionnaires, resulting in seven completed questionnaires.

At the beginning of the study, practitioners indicated varied comfort levels with services delivered in home contexts (e.g., home visits), as demonstrated by response ratings ranging from 1 to 5. A rating of five indicated a high level of comfort with home contexts. Participants shared an overall increase in their comfort with teleintervention services at the end of quantitative data collection compared to baseline. There was one exception, with Lauren indicating a decrease in comfort with teleintervention between these two timepoints. Additionally, participant responses to the Working Alliance item show an overall increase in the belief that caregivers and practitioners were working towards mutually agreed upon goals at the end of quantitative data collection, compared to baseline. Only one practitioner decreased their rating from 5 in the initial questionnaire to 4 in the follow-up questionnaire.

Of the three initial caregiver responses to the PIEI prompt, one chose item 4 ("The service provider shows me or demonstrates how to do the intervention with my child") and two chose item 5 ("The service provider involves me in a way where I can continue to do the interventions without the provider's ongoing assistance."). Of the four follow-up caregiver responses, one chose item 4 and three chose item 5. Of the four initial practitioner responses, all practitioners selected item 5 for both the initial and follow-up prompts. All responses were marked as 4 or 5, indicating all participants experienced caregiver involvement in sessions that reflected a capacity-building approach. However, when asked to expand on their responses during interviews, Practitioner 6 changed her choice for the initial prompt, which is represented in Table 11. She amended her PIEI response in the initial questionnaire to "I prefer families observe my work with the child," reflecting caregiver involvement that did not reflect a capacity-building approach. This rating improved in her follow-up response.

Qualitative Findings

Qualitative findings sought to explain quantitative results, to some degree, by understanding participant experiences with multiple aspects of study activities. Findings reflect major themes presented by both practitioner and caregiver participants during interviews that followed data collection for the SCR portion of the study. Participants spoke of three primary topics during interviews: (1) their experiences with the virtual training and coaching intervention, (2) their experiences with and perspectives of the triadic strategies, and (3) other factors that may have influenced their use of or experiences with a triadic approach during sessions.

Practitioner Experiences with the Intervention

Practitioners shared their experiences with the intervention, focusing specifically on the multiple components of the coaching process. Their responses highlight their overall impressions of the coaching process, which components did or did not support their learning, and how practitioners supported their implementation of strategies during sessions with their participating family.

Coaching Process. Overall, practitioners felt supported by the coaching process and believed it helped them incorporate the triadic strategies during their sessions with families. As stated by Phoebe, practitioners felt that coaching helped them "take the leap and dive in" to using strategies that they had heard of previously but didn't "really know where to start implementing them or how to think about using them day-to-day." This was due, in part, to the simplicity of the strategies, in how they were defined and how they were presented. Practitioners found the triadic strategies to be especially accessible and "very doable" in sessions, compared to previous experiences with caregiver coaching models. Flora described the actions involved in each

strategy as "chunks," or "simple things" and shared that thinking about the strategies in this way made it "easy to remember what strategies I need to be using, and then…really easy to implement them."

Coaching Components. Practitioners preferred specific components of the virtual coaching intervention over others. Of the four primary coaching components addressed in each session (debrief, observation of the video clip, reflection and feedback, and action planning), each of the practitioners said that they favored the opportunity for reflection and feedback above each of the other coaching components. For three of the four practitioners (Lauren, Phoebe, and Beau), the shared observation component was an essential part of the reflection and feedback process and provided the content necessary to spark their recollection of the experience. As Lauren said, "I think being able to watch myself or hear myself, and then asking, what really worked well? What was a challenge for you? What did you see that mom did?... I think that was pretty helpful." Alternatively, Flora found observation of the clip to provide the least insight during coaching sessions and preferred to engage in a more extensive practice of self-reflection independently. While she found that "watching myself and then seeing how I was using things was helpful," she preferred to do so "on my own time." However, while practitioners found value in watching clips of their teleintervention sessions, they also described the process as uncomfortable. As stated by Phoebe, this shared observation experience was "just ever so slightly [uncomfortable]. It wasn't too bad." This was echoed by Beau and Flora, who also stressed that the insight they gained through self-observation was greater than their discomfort with it. They considered this uneasiness to be a natural aspect of growth, as described by Beau, when they said, "the process of being so reflective…and having to think about how you're going to change it and be more effective, that growth process can be uncomfortable." Only Flora listed

action planning as one of her favorite coaching activities for its usefulness in helping her think through how she would apply the strategies to her next session.

Practitioners also reported which coaching components they found to be less supportive of their learning. For Lauren, Phoebe, and Beau, action planning was the least essential coaching activity. While they believed action planning to be beneficial for goal setting, they found that filling in a form with their goals did not support the implementation of the strategies. Beau described this when they said,

> Well, it's probably good for me. I think that actually writing in the form didn't feel necessarily that helpful, because we had just talked about it, but you're probably more likely to do a goal if you write it down or something, but I never looked back on the form or anything...I don't know, but as far as actually, 'Oh, this is helping me,' It's probably the least helpful [component].

Other practitioners reported that they seldom, if ever, looked back at their action plan before sessions. Lauren felt that action-planning was inconsistent with her personality and described herself as a "I'm-going-to-jump-in-and-do-it, like the day-of type person." In addition to not benefitting from the process of writing the action plan, Phoebe also found that reviewing the previous week's action plan near the beginning of each coaching session was "a little painful." It served as a reminder for what she had intended to do during the session and sometimes did not carry through. However, she also believed the process to be a valuable part of coaching, for reasons unspecified.

When asked to reflect on potential changes to the content or structure to the coaching intervention, practitioner responses varied. None of them suggested switching coaching from a virtual to in-person delivery, but they did express interest in receiving support with implementing

strategies during in-person EI visits, with families who receive services less frequently than weekly, with families who are just beginning services, or with families who are harder to reach.

Supporting Implementation. As a subset of the action planning process, practitioners brainstormed with their coach to come up with tools and approaches to help support their implementation of triadic strategies during sessions with their participating family. Multiple practitioners described using specific tools to support their implementation of triadic strategies. For instance, Phoebe would sometimes make a note on her data sheet about the strategy she was focusing on for a given session. Beau and Flora reported high levels of engagement in scaffolding their own supports for implementation compared to the other practitioners. Flora reported using reminders in the form of sticky notes applied to her computer screen with a comment about what strategy she wanted to work on with the family. For example, if she wanted to focus on affirming parent competence (AP), she would write a sticky note with the words, "positive things," and affix it to her computer screen to reference during the session. Likewise, Lauren, Beau, and Flora found it helpful during coaching sessions to choose one strategy to focus on implementing with their participating family during the following teleintervention session, as opposed to choosing two or more strategies. As Flora described, “The most effective thing for me was just to pick a strategy and be like, all right, affirming parental competence. Got it.” Using a simplified approach to implementation helped them incorporate newly learned skills into their work. Frequently, practitioners chose to focus on establishing and maintaining the dyadic context during sessions in their action planning, as said by Beau, to "make sure my sessions are focused on the interaction between caregiver and child."

The Triadic Strategies in Service Delivery

Practitioners and caregivers shared their lived experiences with and their perceptions of the triadic strategies. The data presented in this section represent all participant voices to convey a holistic view of multiple aspects of the strategies. During interviews, participants were invited to reflect on the strategies and their definitions and recall instances of implementation. Participants were also presented with visual data displays of both practitioner use of strategies and dyadic interactions for their triad only. The primary topics shared by participants are as follows: (1) practitioner perspectives of the usefulness of the strategies, (2) caregiver perspectives of the helpfulness of the strategies, (3) benefits and challenges with establishing and maintaining a dyadic context during sessions, and (4) perceived changes in service delivery during the study period.

Practitioner Perspectives of the Strategies. Practitioners described overall positive experiences with implementing the triadic strategies (ED, AP, FA, PD, MO, SU) during sessions with their participating family. Each practitioner reported that using this set of caregiver coaching strategies improved their work with families for various reasons. For instance, practitioners believed that using the triadic strategies improved their caregiver coaching skills overall. Specifically, Phoebe reported no longer feeling like she "needed to know what to do every second," and felt more comfortable with incorporating caregiver coaching into her sessions. As she explained, "focusing on that parent coaching piece has really shown me that you don't have to know what to say and you can just describe what's happening and that's enough."

Practitioners explained why they chose to use select strategies and how they perceived them to benefit their work with families. Most often, practitioners favored individual strategies over others when they felt the strategy met the family's needs. All of the practitioners identified

unique family needs and described how select strategies matched those needs. For instance, Lauren felt that she frequently used the strategy *Provide Developmental Information* to support the caregiver's understanding of her daughter's progress over time and the skills her daughter was developing. Lauren, Phoebe, and Flora found that using the strategy *Focus Attention* was helpful in supporting the caregivers in recognizing their child's cues. For instance, Flora supported her participating family with feeding therapy for the child and believed an important part of this was helping the caregiver with noticing their child's cues during meals, "and having them understand the cues," such as the child looking away from the food or using facial expressions to convey their dislike. Beau found that the caregivers they worked with experienced worry and uncertainty regarding their efforts with their child, and sought to mitigate them, "I think a lot of parents just think that…they're doing a terrible job, and so, [I'm] helping them see how much they can do and how much they know about their kids. Yes, just to make them feel comfortable and confident in that relationship, I think has been where I put a lot of my energy." Correspondingly, this practitioner believed that *Affirm Parent Competence* and *Provide Developmental Information* were the most supportive strategies to use for the caregivers they worked with. Instead of identifying caregiver needs as the catalyst for strategy use, Phoebe reported using the strategies she felt most comfortable with. She described herself as a "people-pleaser" and felt that *Affirm Parent Competence* was helpful with keeping a positive tone throughout sessions and focusing on the caregiver's strengths. Each of the practitioners identified the strategy *Suggest* as one that was familiar to them before the study and considered it to be widely used in EI. As Phoebe stated, "Making suggestions is our strong suit. [laughs] I think that's where I'm most comfortable."

Alternatively, Lauren described challenges she encountered with implementing triadic strategies during sessions with her participating family that persisted throughout the study. She was ultimately unsure of what caused these challenges but considered them to be potentially due to several factors, including a potential "language delay." Lauren observed a lack of confidence in the caregiver she worked with and connected this to cultural constraints. As she said,

> I think when we started this, mom was not very confident in what she was doing as a parent for [child]. In their culture, a lot of the time it's based off of, I have to do this and I have to do this and I have to do this, I don't have enough time for [child]. Teaching mom that first off, not to say that you don't have time for her, but incorporating her into the daily motherly things that she has to do.

This practitioner found it difficult to *Provide Developmental Information* to the caregiver, as she wasn't sure if the caregiver understood the information that she, the practitioner, was sharing through the interpreter,

> I don't think she-I think she understands what child development is, but I [would talk] to her about it and then she just said ‘okay’. I don't know if it really stuck with her, sometimes. I think sometimes it did and sometimes it didn't. I think that was probably the hardest one.

Lastly, Lauren found it hard to help the caregiver *Focus Attention* to her child's cues, because, as the practitioner said, "I don't think she really understood or watched or listened for those.” In other words, Lauren described difficulty with helping the caregiver notice her child’s cues because she believed the caregiver didn’t understand or seek out cues from her child.

Caregiver Perspectives of the Strategies. Caregivers shared their perspectives of and experiences with practitioners implementing the triadic strategies during sessions, citing which

strategies they believed to be most helpful for them in supporting their children. Among the strategies favored by caregivers were *Affirm Parent Competence (AP)*, *Provide Developmental Information (PD)*, and *Suggest (SU)*. Most caregivers felt they were already aware of their child's cues (*FA*) and needed little support with that.

Caregivers described how these strategies were helpful when practitioners incorporated them into their sessions. All four caregivers appreciated when practitioners commented positively on the child's skills and developmental trajectory and the caregivers' efforts. Jane especially appreciated when her practitioner would tell stories about other children's development, "She's always really good about talking about the other kids that she's had, kids that have graduated. I think that's helpful for me because, it's something to look forward to and not focusing so much on just all of the worrying." Navigating worry and fear regarding their child's development was a common theme among caregivers. As Sharon said, "you just worry, you worry," about the child's needs and how the caregiver can support those needs. She went on to describe how her practitioner's use of AP and PD specifically helped her to "neutralize" those fears and worries so she can "move forward." Sharon also described at length how important it is for practitioners to use positive, capacity-building caregiver coaching strategies, such as AP, to help caregivers feel that what they're doing to support their child is "the right direction." As she explained, "I think that finding anything that can be legitimately applauded or 'Good jobbed' is really useful for parents because there's no more gold stars that you usually get in your work or something." She believed that doing so not only affected the caregiver, but also helped the "kids to get the most help from EI," as they benefited from their caregiver's sense of confidence and competence. Taryn also described feeling uncertain about how best to support her daughter's development when she said, "There is a stress on me every week of me knowing 'am I doing

enough for her?...Am I doing the best thing?' You always have those questions in your mind, especially at the end of the day." She appreciated when her practitioner provided ongoing support and "positive reinforcement" during sessions. Caregivers also described how helpful it was for practitioners to provide suggestions (SU) about what caregivers could do to help support their child's development during and between sessions. All four caregivers valued this form of support. Jannie explained how her practitioner gave her ideas for how to teach her daughter specific pronunciations, such as "using hand and using touch…or touching the jaw" to elicit sounds. Caregivers found that when practitioners provided suggestions for tools to use with their child, which sometimes incorporated the use of modeling (*MO*), caregivers were more equipped to support their child independently, which was important to them. Caregivers often alluded to the value these strategies provided when used in tandem. As Sharon stated, "I would say people need concrete ideas and they also need validation and support."

Establishing and Maintaining a Dyadic Context. Participants recognized establishing and maintaining a dyadic context (ED) as essential to the success of the triadic approach, yet practitioners found it sometimes challenging to facilitate dyadic interactions. Lauren, Phoebe, and Beau talked about their initial concerns regarding increasing their facilitation of dyadic interactions during sessions and how these concerns shifted over the course of the study. Ultimately, they considered those concerns to be unfounded, and the use of ED (and overall facilitation of dyadic interactions) was more positive and beneficial than expected.

Phoebe conveyed that she rarely saw the child during her sessions prior to the study and instead worked primarily with the caregiver. Facilitating dyadic interactions was unfamiliar to her and she "hadn't attempted it much". Throughout the study, it was made clear to her that asking mom to get on the child's level and work through activities with him "has been so

helpful," especially for mom's learning. While she had believed in the benefits of encouraging dyadic interactions during sessions before participating in this study, she did not typically apply caregiver coaching practices. As she said, "Now, I feel like I prefer to watch their interaction and help where I can. Even though that belief might have been there… I don't think I understood what it was to do that until now." Even still, she found it sometimes challenging to facilitate dyadic interactions during her sessions and questioned their value for this particular family. Instead of engaging in activities with her child, she felt that this caregiver needed time to process emotionally. She wondered if the caregiver instead needed, "a non-judgy space to talk about being a parent to a kid with special needs. I feel like that's where a lot of our conversations go." Beau was concerned that increasing the amount of time the caregiver and child spent in interaction would decrease the time available for caregivers to share and work through their own general concerns about their child. They were "really worried" that making this shift would result in caregivers feeling like they wouldn't "have space to share those concerns, and make sure that they were heard, and felt supported in that area." Instead, Beau found that supporting caregivers in the context of play and interaction with their child allowed the practitioner opportunities to point out caregiver strengths in the moment,

> Instead of saying, “Oh, I see you do it all the time.” It was like, ‘You just did it. This thing that you're worried you don't do. You just did it and you're doing a great job.” [It] was just more meaningful for them to see it in the moment… It was better when it was within the context of an activity they were doing.

Lauren found it challenging to step back from interacting with the caregiver and child to allow dyadic interactions to take place. Where previously she had felt compelled to continue modeling or giving suggestions to caregiver and child, she realized during the intervention phase

that she "didn't always need to be saying something." Furthermore, she was initially uncertain regarding the caregiver's competence in leading sessions. She described that establishing a dyadic context was "a little bit hard for me in letting mom take control because I don't really know if she knew how to do that in the beginning." However, towards the end of the study, she felt that this became "a little easier."

Overall, caregivers also found it easy to incorporate more moments of interacting with their child during sessions. Jane stressed the importance of following her child's lead and engaging his interests during these interactions so as not to initiate "something that he wouldn't actually enjoy doing." Taryn enjoyed exploring and practicing activities in which she could embed speech with her daughter and described ED as her "number one" strategy because "it helps us with the activities that we have during the week." In addition to supporting caregiver learning, practitioners believed that increasing caregiver child interactions during sessions improved caregiver child relationships and the overall quality of teleintervention sessions. While Flora did not express any initial conflicting beliefs with regards to increasing dyadic interactions during sessions, she did recognize the benefits this imparted. She described how supporting the caregiver in interactions with his daughter has shifted the quality of their time together and that the dyad both enjoy interacting with each other more now. As she said,

> I feel like it's much more natural, and dad is just really enjoying talking to [child]. [Child] is really happy to talk to dad. It feels like I have less to do with it, and they have more of a rhythm now… I feel like the focus of therapy has changed from talking to me about her to interacting with her.

Perceived Changes in Service Delivery. Participants were asked to broadly describe any changes in their teleintervention sessions during the five-month study period and were invited to

look at a line graph representing practitioner and dyad behavior for their triad. Caregivers provided mixed responses when asked to reflect on the changes they noticed, reporting either no noticeable change or observing practitioners' use of only select strategies. Two caregivers remarked on practitioners' increased efforts to facilitate dyadic interactions. Jane recalled her practitioner inviting more of these interactions, such as asking to see her and her child "in different scenarios, trying to get him to make a choice of one thing or the other, having him color and stuff." Taryn felt that with the introduction of practitioner training and coaching, she had more "one-on-one" activities with her daughter. Sharon noticed her practitioner providing her with more positive comments or describing more of her daughter's developmental accomplishments. With the former observation, she described her practitioner engaging in more "cheerleading, in the sense of what you're doing is great" and with the latter, "reminding me of the change that's happened" with her daughter's development.

Conversely, Jannie reported that she didn't "see any difference in the last six months." However, Taryn was pleased that her practitioner did not significantly shift her practice style. She believed that her practitioner had been "pretty consistent [with] no drastic changes in her coaching" and thought it was "nice that she is consistent on that." Other caregivers echoed this sentiment, such as when Sharon observed that too much change at once could potentially make her practitioner's approach unrecognizable. In response to viewing the data, most caregivers had additional questions about research activities. These questions often led to conversations between the caregiver and interviewer regarding study variables, aims, and procedures, such as when Jannie asked, “Based on the data you collect…does it show if [child] is making progress?” Caregivers also shared reflections on their behavior or their practitioner’s behavior. For instance, Jane concluded that "there can definitely be a greater effort, on my part, to initiate him being

more present" during sessions and engaging in more dyadic interactions. Jane believed this would allow her practitioner to get to know her son better and inform her practitioner about how to better support the caregiver.

Contrary to caregiver narratives, most practitioners felt significant changes occurred in their practice during the study period. Beau and Flora were surprised to see the data and felt that it underrepresented their implementation of strategies. As Beau said, "These numbers seem super low. It feels like they should be higher." Flora also identified this mismatch between the data and her personal experience with the intervention and how it influenced her work, "On paper, it just looks like the intervention wasn't so great, but internally, I feel like it was really great." These practitioners felt like they were more intentional in their sessions and held a greater awareness of what they were doing in their work with families and why. Reflecting on the similarity between her use of triadic strategies between baseline and intervention, Flora shared, "Even though I'm using the strategies pretty consistently, I feel like the quality of the use of the strategies changed, but that's hard to quantify." Lauren was pleased to see increases in dyadic interactions evident in the intervention phase of her data and interpreted this as a sign that the caregiver was more comfortable interacting with her child. However, Phoebe thought the data aligned with her experience of her practice, noting the slight shift down in her use of strategies between intervention and maintenance. As she said, "during coaching, I did more [implementing of strategies] than I would usually, and then I could feel it kind of slipping."

Factors Influencing Implementation of Strategies

Practitioners and caregivers described multiple factors involved in service delivery that may have had an influence on the overall implementation of triadic strategies. These included (1) practitioners' educational and professional backgrounds, (2) practitioner experiences with the

teleintervention context, and (3) how caregivers and practitioners made meaning of their respective roles in their work together.

Practitioner Backgrounds. While most of the practitioners had been providing EI services for over a year, they varied in their educational and professional backgrounds. Several of the practitioners described these experiences to be influential in their work with families. Beau reported working in the field just under a year and had not yet had the opportunity to work with families in-person. All their EI service to date was provided via teleintervention. Flora had been working in the field for approximately two years but did not feel that her graduate level education had prepared her to actively involve caregivers in sessions. Throughout her program, including her clinical rotations for speech therapy, she said the focus for students was that "we model for the child, and we make suggestions to the parent and that was about it." She did not receive any guidance for how to work with, or coach, caregivers. Phoebe indicated that she had attended webinars and conference presentations regarding in EI but did not go into further detail about her training. Among the participants for this study, Lauren was uniquely trained among the participants as a special educator, with several years of experience as a K-2 classroom teacher followed by professional experience in Applied Behavior Analysis. She described previous experiences as,

> ...from the education background of the public school system and we never got to do [caregiver coaching], so I got a lot of the kids who were in Special Ed or Gen Ed not understanding a lot…when I would go and talk to the parent about it, they're like, well, I didn't know how to do that, or I didn't understand that.

She entered the field of EI professionally sometime after her son received a diagnosis and described herself as coming from a “parent perspective” in her work with families.

Teleintervention. Practitioners had mixed experiences with implementing triadic strategies via teleintervention. For most practitioners, this was a barrier; for one, it was considered a benefit. All four practitioners identified how teleintervention services limited their ability in some way to adopt a triadic approach successfully. Specifically, they all shared that modeling strategies for caregivers was much more challenging to do over the computer. Practitioners 2 and 4 felt it was more difficult to establish a dyadic context and help the family set up dyadic activities. For instance, Flora believed that if she were in the family's home, she could move about the house and join them in a variety of activities. However, by delivering services through a screen, she said, "I really think that the family has it in their head that we work at the table because I'm in a computer, so they want to set me on the table. I think it's a little more stilted than if I was at the house." Lauren also described challenges with teleintervention, though these were broader. She found that working with the family and trying to "maneuver and figure out how you're supposed to do all this through a screen" was generally "nerve-wracking." However, Beau thought teleintervention supported a triadic approach. They described the "benefit" of teleintervention being that the caregivers "have to be the ones doing it if it's happening." With practitioners on the other side of the screen, caregivers have a greater opportunity to take on a more active role through targeting difficult routines, trying out strategies with their child, and then problem-solving with the practitioner.

Caregiver and Practitioner Roles. Multiple relationship-building factors potentially influenced the implementation of triadic strategies. For instance, Dyads 3 and 4 sometimes had both caregivers present. For Dyad 3, the second caregiver sometimes joined sessions from another computer away from the home. When asked about how they established relationships with families, most practitioners reported that they did not have a direct conversation with their

participating family about caregiver coaching, their respective caregiver-practitioner roles, or expectations for how sessions would be conducted. Two of the four practitioners believed that these concepts came to be understood organically throughout their time together with the family. Lauren explained that she hadn't thought about having a conversation about roles and expectations with families and instead preferred to

> ...just come into the home and start out really slow and then once I know that the parents are comfortable with me… we just…shoot for the stars is what I would say and get their child to where they need to be.

Similarly, Phoebe described how she often shared her title and background with families but that an understanding of caregiver and practitioner roles "comes up throughout our time together." Moving forward, she said that future conversations with new families will likely include more information about caregiver coaching roles and "how it differs from direct service." She also wondered if introducing a triadic approach with a new family she had not already established a working relationship with would have yielded a higher use of strategies for her. She thought perhaps if she and the family had "started out just knowing" that they would be incorporating caregiver coaching strategies they, "might have been more easily integrated." Flora said this conversation "usually comes up" and she often speaks about the caregiver coaching model with families during their evaluation process. However, it was unclear if she conducted the evaluation for her participating family, allowing that initial conversation. This practitioner also expressed frustration regarding maintaining expectations for caregivers throughout service delivery. She reported families not having preplanned activities ready for speech sessions (e.g., having a chosen book available or waiting until the speech session to offer snack to their child) or showing up for sessions on their phone in grocery store parking lots. As she said,

> I think the hardest thing is the expectations…having a family know that we're not going to go make pancakes now…These are the expectations before we even start. That's hard for me to lay down the law and then keep it, to keep reminding parents of the expectations.

Despite practitioners' assumptions that caregivers understood caregiver and practitioner roles, most caregivers expressed uncertainty regarding what was initially expected during sessions. They also did not recall having a conversation with practitioners on the subject during the first visit or after multiple visits. When asked about her role during sessions, Jannie described it as "not clear" but that during sessions her practitioner would tell her "Do this, do that" and as they progressed over time, she understood what work she needed to do at home with her child. Jane mentioned that they "just went into stuff" and she would try and manipulate the laptop during sessions so her practitioner could see what her child was doing. Taryn said she would have liked to have a conversation about roles and expectations with her practitioner in the beginning and added, “I guess that would have helped probably, a little bit just to clarify. At first it wasn't awkward, but it was like, ‘Okay, I just want to make sure I know I'm doing the right thing.’” Most caregivers felt they understood what their role was and what their practitioner’s role was when asked at the end of the study. However, it was unclear if these roles consistently reflected a caregiver capacity-building approach.

Unlike the other triad families, Beau and Sharon both confirmed having an initial conversation about caregiver coaching roles with one another at the beginning of their relationship. Caregivers at their center are given a "parent-staff commitment form", which states that caregivers are expected to be actively involved during sessions. Beau shared that they also describe to the caregiver what coaching looks like and then re-visits the conversations frequently

over the first few visits. Sharon also discussed this experience and found this upfront conversation about roles and expectations to be beneficial for their working relationship. She expressed that it was "useful to have that conversation in the sense of understanding how we're going to work together."

Mixed Methods Findings

As stated previously, quantitative results were based on visual analysis of SCR data and descriptive analysis of the Demographic and EI Experiences Questionnaire. At the same time, qualitative findings represent data resulting from the mixing of quantitative and qualitative data collection procedures to help explain quantitative results. The mixed methods findings presented here represent the integration of quantitative and qualitative data and meta-inferences interpreted from these merged data. First, broad descriptions of mixed methods findings are summarized according to research questions three, four, and five for this project. This set of findings correspond with the major qualitative themes presented previously. Second, mixed methods findings are presented in a series of joint data displays (see Tables 12-15), by triad, to honor the contextual nature of single-case research and the detail afforded by working with matched triads.

Practitioner Experiences with the Intervention

In alignment with our third research question, reports from practitioners' experiences with the coaching intervention indicate how coaching supported their implementation of triadic strategies with families. All practitioners described coaching as beneficial to their work with families and articulated which specific components were particularly helpful. According to visual analysis of quantitative data, "The intervention was functionally related to a consistent increase in practitioners' level of implementation of triadic strategies for most practitioners." Qualitative data suggest how the coaching intervention may have supported practitioners' use of

strategies with families. For instance, practitioners in this study found the simplicity of the strategies supported their understanding and implementation during sessions with families. Individual experiences with coaching components, such as observation, reflection, and feedback, were generally valued by practitioners and may have contributed to a higher or more consistent use of strategies for some practitioners compared to others.

Alternatively, many practitioners believed that action planning did not increase their implementation of strategies. For example, Phoebe admitted to rarely checking her action plan or reviewing which strategies she planned to focus on for the following EI session with her family. Therefore, when she reviewed her action plan with the coach at the beginning of each coaching session, it was an unwelcome reminder for what she had intended to do during her EI session but may not have followed through with. However, select practitioners did use tools to increase strategy use that were chosen during action planning. For instance, Beau and Flora described high levels of engagement with using specific tools to support their use of triadic strategies in their teleintervention sessions with families. For instance, Flora reviewed her action plan before EI sessions with her participating family and chose actionable items during action planning to use in her EI sessions, such as applying sticky notes to her computer screen with reminders for which strategies she wanted to focus on with the family.

Other factors influencing implementation of strategies during sessions were reported by caregivers and practitioners and are explored later in this chapter and in the discussion.

The Triadic Strategies in Service Delivery

Descriptions of practitioner and family experiences with and perspectives of triadic teleintervention service delivery inform their engagement with the implementation of the triadic strategies and participation in dyadic interactions. When taken in conjunction with quantitative

findings, these descriptions provide a mixed methods interpretation for our fourth research question.

Experiences with Capacity-Building Practices. Practitioners shared their overall positive experiences with using the triadic strategies, specifically regarding how these strategies targeted perceived family needs and describing which strategies felt more comfortable for individual practitioners to include in sessions. Caregivers shared at length their perceptions of the potential benefits reaped by the use of these strategies, especially AP, FA, PD, and SU. According to caregivers in this study, receiving validation and encouragement from practitioners (AP) was essential for feeling confident that they were positively influencing their child's development. Caregivers also appreciated practitioner comments and questions that helped caregivers understand more about their child (FA, PD) and that provided specific developmentally supportive activities and strategies that caregivers can use with their child during and between sessions (SU). Practitioners recognized Establish Dyadic Context (ED) as essential to the success of the triadic approach, yet sometimes found its implementation challenging. Ultimately, practitioners described the usefulness of facilitating dyadic interactions as outweighing its difficulties and caregivers reported that interacting with their children during sessions was easy to do. These positive observations by both practitioners and caregivers reflect the moderate level shifts in dyadic interactions between baseline and intervention phases.

Perceived Use of the Strategies. Consistent with practitioners' low to moderate level changes in strategy use, caregivers described minor shifts in their practitioners' service delivery, though they did note increases in practitioners' focus on dyadic interactions, and encouragement or suggestions provided for the caregivers. However, at least half of the practitioners described feeling that their implementation of triadic strategies increased more than what was reflected in

the data. They surmised that this could be related to factors that cannot be quantified, such as shifts in implementation quality and changes in personal experiences with intention and awareness of caregiver coaching strategies. More specifically, these practitioners described feeling increasingly more cognizant of how they were working with caregivers, beyond what was represented in the data displays.

Factors Influencing the Implementation of Strategies

Our fifth research question considered the multiple factors potentially contributing to triadic strategy implementation. Visual analysis of quantitative data shows a functional relation between the intervention and practitioner implementation of strategies with low to moderate increases in practitioner behavior from baseline to intervention. Experimental control for practitioner behavior was demonstrated for three of four participants. Participant responses to interview questions explained, to some extent, what may have contributed to or served as barriers to practitioner use of triadic strategies, apart from training and coaching. Parents and practitioners discussed multiple potentially influencing factors.

Teleintervention. Participants reported varied perceptions of conducting services via teleintervention. Parents provided little comment about teleintervention, apart from one account that virtual service delivery was more convenient. However, practitioners held varying beliefs regarding teleintervention's influence on their ability to work with caregivers meaningfully and effectively. Some felt it limited their ability to support dyadic interactions by confining activities to a table, where the computer could be placed. Lauren considered teleintervention to be a barrier to strategy use, which may contribute to low experimental control in her data. Based on questionnaire responses, Lauren was the only participant who reported feeling less comfortable

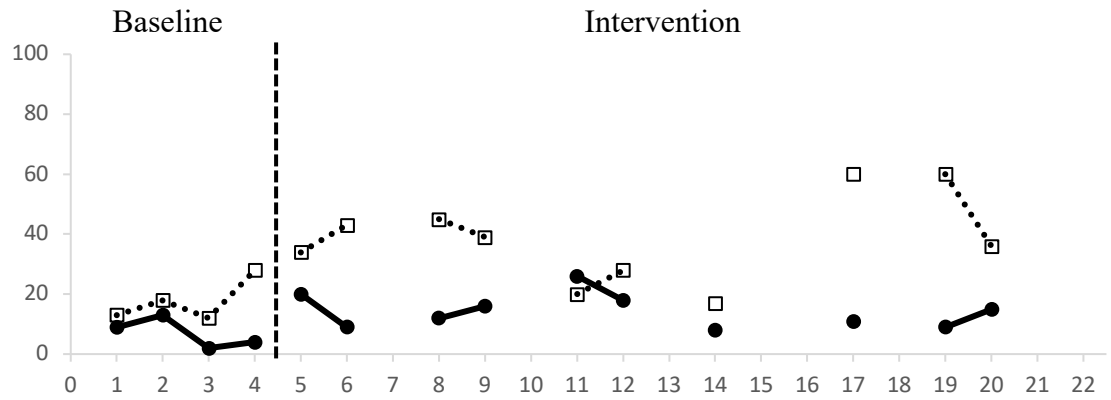
with teleintervention at the end of the study compared to the beginning. All other participants noted an increase in comfort with this mode of service delivery.

Training. Practitioners believed that their previous education, training, and professional roles contributed to their experiences with the intervention and with implementing the triadic strategies. While most of the practitioners were familiar with EI aims and the mechanisms of family-centered practice, none of them reported receiving formal training in how to support capacity-building caregiver learning opportunities. Instead, practitioners in this study described learning discipline-specific information for supporting child development in either classroom (early elementary) or therapy (speech, physical, behavioral) settings during their preservice education. This was their first experience with training in and corresponding application of caregiver coaching practices for each of them.

Caregiver and Practitioner Roles. Another factor that potentially contributed to both practitioners' use of strategies and dyadic interactions was participants' understanding and communication of their roles and expectations during EI sessions. Implementing triadic strategies requires a triadic orientation, with practitioners facilitating dyadic interactions and avoiding child-directed services. Most participants shared that they had not discussed the manner in which sessions would be conducted and what respective practitioner-caregiver roles would look like. Consequently, caregivers were unclear, at least initially, regarding how sessions would be conducted and what was expected from them during sessions. Correspondingly, responses for the working alliance prompt on the questionnaire were mixed. Of the seven participants who completed pre- and post- questionnaires, two practitioners reported slight increases in the quality of their working relationship with caregivers, and one practitioner reported a decrease. One caregiver noted feeling an increased working alliance with their practitioner.

Table 12

Joint display of results for Triad 1

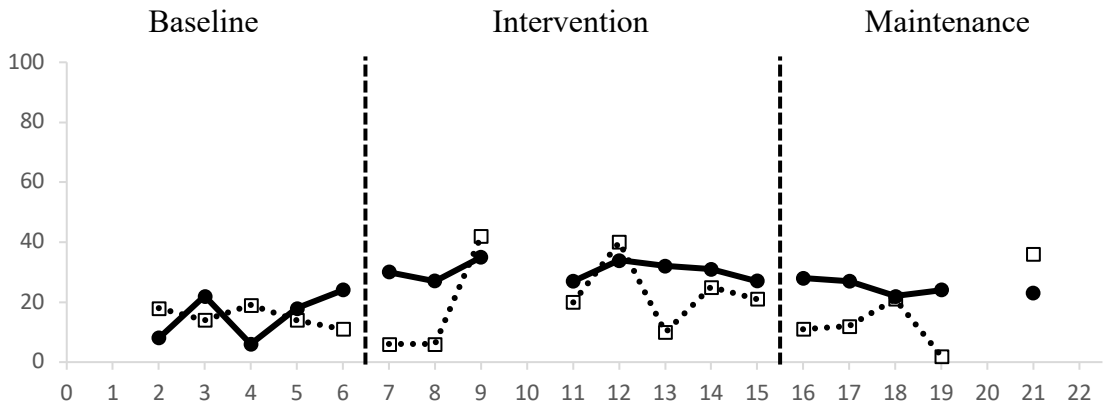


Quantitative summary	Qualitative representation	Mixed methods meta-inferences
Lauren exhibited low variability and low, stable levels of implementation of triadic parent coaching strategies during four consecutive baseline sessions with her triad family. With intervention, her strategy use showed a minimal increase in level, moderate variability, three overlapping data points, and a predictable and stable accelerating and decelerating trend. This triad had the greatest	"I think being able to watch myself or hear myself, and then asking, what really worked well? What was a challenge for you? What did you see that mom did?... I think that was pretty helpful."	Lauren showed overall low implementation of strategies, with slight increases during intervention. Despite this, she believed training and coaching had a positive influence on her work and was pleased to see increases in dyadic interactions when looking at the data. She participated in all coaching session components but otherwise preferred to not plan for sessions with her triad family. This practitioner reported enjoying using triadic strategies with her triad family but needed extra support with *Establish Dyadic Context*.
	Lauren felt that action-planning was inconsistent with her personality and described herself as a "I'm-going-to-jump-in-and-do-it, like the day-of type person."	
	This practitioner found it difficult to Provide Developmental Information to mom as she wasn't sure if it "really stuck with her." She also found it hard to help the parent Focus Attention to her child's cues, because, "I don't think [mom] really understood or watched or listened for those." She largely attributed challenges with strategy use to a lack of understanding in the parent, potentially due to a "language delay."	
	Jannie explained how her practitioner used suggestions to give her ideas for how to teach her daughter specific pronunciations,	

number of missing data sessions throughout the intervention phase. Dyad 1 demonstrated low levels of interactions with mild variability in baseline. Despite high variability and low stability, this dyad exhibited overall higher levels of time spent in parent-child interactions during intervention as compared to baseline.	such as "using hand and using touch…or touching the jaw" to elicit sounds.	This was her primary focus during coaching sessions. This practitioner reported experiencing challenges with the parent's low confidence and competence, teleintervention service delivery, and facilitating dyadic interactions during sessions. Other considerations for low, variable strategy use include her foundational training and experiences as a classroom teacher and ABA professional. Low levels of strategy use and increased levels of dyadic interaction correspond with the practitioner's realization that she "didn't always need to be saying something," such as suggestions for parent and child. Jannie found her practitioner's suggestions to be helpful but didn't notice a change in her practitioner's service delivery style over the study period and was unclear about her role during sessions.
	She described that establishing a dyadic context was "a little bit hard for me in letting mom take control because I don't really know if she knew how to do that in the beginning." Towards the end of the study, she felt that this became "a little easier."	
	Where previously she had felt compelled to model or give suggestions to parent and child, Lauren realized during the intervention phase that she "didn't always need to be saying something."	
	Jannie reported that she didn't "see any difference in the last six months" in her practitioner's service delivery.	
	Lauren was pleased to see increases in parent-child interactions in the intervention phase and interpreted this as a sign that the parent was more comfortable interacting with her child.	
	Lauren was uniquely trained among the participants as a special educator, with several years of experience as a K-2 classroom teacher followed by professional experience in Applied Behavior Analysis.	
	Lauren found that working with the family and trying to "maneuver and figure out how you're supposed to do all this through a screen" was generally "nerve-wracking."	
	Lauren hadn't thought about having a conversation about roles and expectations with families and preferred to "just come into the home and start out really slow and then once I know that the parents are comfortable with me… we just…shoot for the stars is what I would say and get their child to where they need to be."	
	Jannie described [her role during sessions] as "not clear" but that during sessions her practitioner would tell her "Do this, do that" and as they progressed over time, she understood what work she needed to do at home with her child	

Table 13

Joint display results for Triad 2

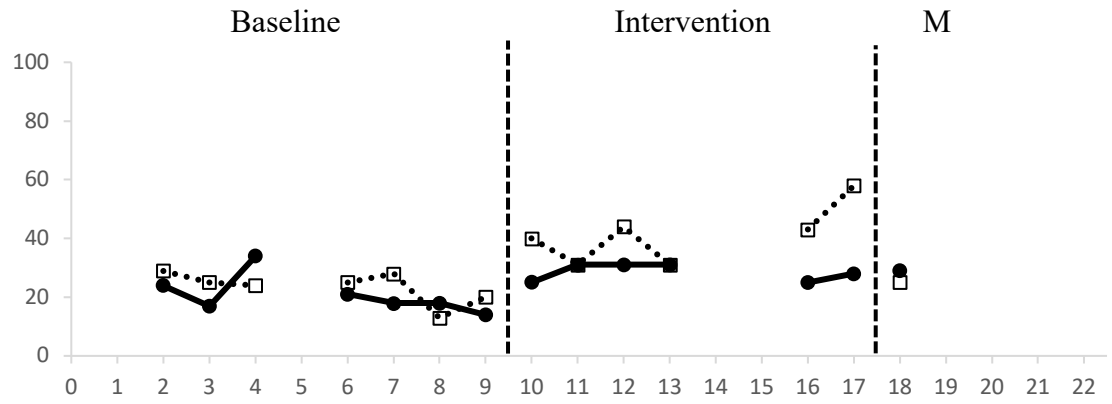


Quantitative summary	Qualitative representation	Mixed methods meta-inferences
Phoebe exhibited overall low baseline levels of implementation of triadic strategies with moderate variability and a slightly accelerating trend for the final three sessions of the baseline phase. With the introduction of intervention, she had a slightly higher level of strategy implementation, low variability, and a stable, flat trend throughout. There were no overlapping data points. In	Phoebe felt that coaching helped her "take the leap and dive in" with using strategies that she had heard of previously but didn't "really know where to start implementing them or how to think about using them day-to-day."	For Phoebe, training and coaching supported a slight increase in the use of triadic strategies into her sessions. This practitioner previously understood the value of parent coaching but did not consistently apply it in her work with families prior to intervention. While coaching was overall beneficial to her practice, she found the observation and action planning components to be slightly uncomfortable, but valuable for improving her practice. For this triad, establishing and maintaining dyadic interactions was sometimes challenging throughout intervention
	Phoebe found that reviewing the previous week's action plan near the beginning of each coaching session was "a little painful." It served as a reminder for what she had intended to do during the session and, sometimes, did not carry through with.	
	Using the strategies supported Phoebe's work: "focusing on that parent coaching piece has really shown me that you don't have to know what to say and you can just describe what's happening and that's enough."	
	Phoebe described herself as a "people-pleaser" and felt that *Affirm Parent Competence* was helpful with keeping a positive tone throughout sessions and focusing on the parent's strengths.	

the maintenance phase, her strategy use remained stable, with low variability, and a slightly lower level than intervention. Dyadic interactions were low and stable through baseline. They exhibited an immediate increase in level three days into intervention, which remained higher than baseline, but with moderate variability and overlapping data points. During maintenance, their behavior remained moderately variable, with a level higher than baseline and lower than intervention.	Jane especially appreciated when her practitioner would tell stories, "about the other kids that she's had, kids that have graduated" as a way of positively relating information about her son's skill development and helping her not "worry."	and maintenance, as noted by the variability in dyadic interaction during these phases. The Practitioner believed the parent needed space to talk about her concerns about her child during sessions. She found that shifting away from this parent-practitioner dynamic after months of sessions together was challenging. However, the practitioner and parent both enjoyed using select strategies to maintain a positive, strengths-based approach during sessions. While the parent noticed her practitioner inviting more parent-child interactions, she believed that she could have done more to help her child be present during sessions. The practitioner attributed the slight decrease in strategy use and parent-child interaction in the maintenance phase to a shift in focus during sessions. She could feel the focus on parent coaching "kind of slipping."
	With learning to facilitate dyadic interactions, Phoebe said, "Now, I feel like I prefer to watch their interaction and help where I can. Even though that belief might have been there… I don't think I understood what it was to do that until now."	
	Phoebe found it sometimes challenging to facilitate dyadic interactions during her sessions and wondered if the parent instead needed, "a non-judgy space to talk about being a parent to a kid with special needs. I feel like that's where a lot of our conversations go."	
	Jane recalled her practitioner inviting more dyadic interactions, such as asking to see her and her child "in different scenarios, trying to get him to make a choice of one thing or the other, having him color and stuff."	
	Jane concluded that "there can definitely be a greater effort, on my part, to initiate him being more present" during sessions and engaging in more dyadic interactions.	
	Phoebe thought the data aligned with her experience of her practice, noting the slight shift down in her use of strategies between intervention and maintenance. As she said, "during coaching, I did more [implementing of strategies] than I would usually, and then I could feel it kind of slipping."	
	Phoebe wondered if introducing a triadic approach with a new family she had not already established a working relationship with would have yielded a higher use of strategies for her. She thought perhaps if she and the family had "started out just knowing" that they would be incorporating parent coaching strategies they, "might have been more easily integrated."	

Table 14

Joint display of results for Triad 3

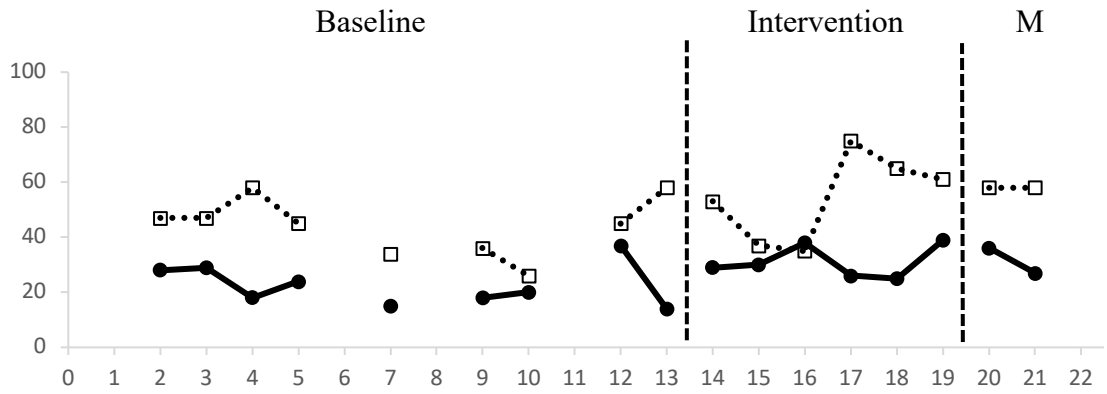


Quantitative summary	Qualitative representation	Mixed methods meta-inferences
During baseline, Beau demonstrated low to moderate levels of strategy implementation, with overall low variability except for one outlier on week 4. This was followed by a stable and slightly decelerating trend line for the final four consecutive weeks of baseline. With intervention, Beau exhibited an immediate, though modest, increase in their use of coaching strategies, maintaining a	Practitioner 03 said, "the process of being so reflective…and having to think about how you're going to change it and be more effective, that growth process can be uncomfortable."	Training and coaching supported Beau's implementation of the triadic strategies. Beau was engaged in the coaching process and supported their strategy use by using tools chosen during action planning, such as deciding to focus on just one strategy at a time during sessions with their family. Consistent with the slight rise in both triadic strategy use and dyadic interactions during intervention, this practitioner often chose to focus on establishing and maintaining a dyadic context with the family. They also emphasized AP and PD, which they believed fit the needs of the family.
	During action planning, Beau chose to "make sure my sessions are focused on the interaction between caregiver and child."	
	Beau found that the parents they worked with experienced worry and uncertainty regarding their efforts with their child, and sought to mitigate them, "I think a lot of parents just think that…they're doing a terrible job, and so, [I'm] helping them see how much they can do and how much they know about their kids. Yes, just to make them feel comfortable and confident in that relationship, I think has been where I put a lot of my energy."	
	As Sharon said, "you just worry, you worry," about the child's needs and how the parent can support those needs. As	

slightly higher level than baseline, low variability, a flat trend line, and minimal overlapping data. This triad missed two sessions during intervention and had only one maintenance session. Interactions for Dyad 3 show a stable and slight decelerating trend throughout baseline and low variability. During intervention, Dyad 3 experienced an immediate change in their time spent in dyadic interactions, an overall higher level compared to baseline, moderate variability, and a potentially accelerating trend for the last two intervention phase sessions.	she explained, "I think that finding anything that can be legitimately applauded or 'Good jobbed' is really useful for parents because there's no more gold stars that you usually get in your work or something."	They found that using AP and PD in the context of parent-child interactions supported caregiver learning. Beau's use of triadic strategies may have also been supported by a belief that teleintervention supported a triadic, family-centered approach. They also initiated had a clear conversation with the family at the beginning of the relationship regarding what caregiver coaching might look like. This increase in triadic strategy use was noticed by the caregiver, who spoke positively of her practitioner's encouragement, support, suggestions, and the developmental information they provided.
	Sharon stated, "I would say people need concrete ideas and they also need validation and support."	
	Beau found that supporting parents in the context of play and interaction with their child allowed the opportunities to point out parent strengths in the moment, "Instead of saying, 'Oh, I see you do it all the time.' It was like, 'You just did it. This thing that you're worried you don't do. You just did it and you're doing a great job.' [It] was just more meaningful for them to see it in the moment… It was better when it was within the context of an activity they were doing."	
	Sharon described her practitioner engaging in more "cheerleading, in the sense of what you're doing is great" and, "reminding me of the change that's happened" with her daughter's development.	
	Beau said of the data, "These numbers seem super low. It feels like they should be higher."	
	Beau described the "benefit" of teleintervention being that the parents "have to be the ones doing it if it's happening."	
	Practitioner and Sharon both confirmed having an initial conversation about parent coaching roles with one another at the beginning of their relationship. Sharon expressed that it was "useful to have that conversation in the sense of understanding how we're going to work together."	

Table 15

Joint display of results for Triad 4



Quantitative summary	Qualitative representation	Mixed methods meta-inferences
Flora demonstrated low to moderate baseline levels of strategy use, with moderate variability, and a somewhat unstable trend line. This triad had three missed sessions during baseline and was the last to be introduced to intervention. With that introduction, Flora's level of strategy implementation immediately increased and maintained a minimally higher level of implementation as	Flora described each of the strategies as "chunks," or "simple things" and shared that it was "easy to remember what strategies I need to be using, and then…really easy to implement them."	At the beginning of the study, Flora felt that her training had not prepared her to involve parents in EI sessions. She was engaged in the coaching process and consistently used tools to support triadic strategy implementation during sessions, such as notes. This supported a shift to slightly higher levels of implementation during intervention compared to baseline, favoring a focus on AP and FA to support speech and feeding. She felt that the teleintervention context made it more challenging to use the strategies, in addition to the family sometimes not being prepared for sessions. She
	Flora used reminders in the form of sticky notes applied to her computer screen with a note about what she wanted to work on with the family.	
	Flora supported the family with feeding therapy and believed an important part of this was helping the parent with noticing their child's cues during meals, "and having them understand the cues," such as the child looking away.	
	Taryn said, "There is a stress on me every week of me knowing 'am I doing enough for her?...Am I doing the best thing?'" She appreciated when her practitioner provided ongoing support and "positive reinforcement" during sessions.	

compared to baseline, low variability, and multiple overlapping data points. During two maintenance sessions, she demonstrated a similar level to intervention, minimal variability, and overlapping data points. Dyad 4 engaged in relatively high levels of time spent in dyadic interactions during baseline with moderate variability and an overall flat trend with a slight deceleration in the middle of the phase. There was no immediate change with the introduction of the intervention, but a marked increase in time spent in dyadic interactions occurred halfway through intervention and maintained through the end of the study. They demonstrated moderate variability during intervention, which leveled out during maintenance.	Taryn enjoyed practicing activities in which she could embed speech with her daughter and described ED as her "number one" strategy because "it helps us with the activities that we have during the week." Regarding facilitating dyadic interactions, Flora said, "I feel like it's much more natural, and dad is just really enjoying talking to [child]. [Child] is really happy to talk to dad… I feel like the focus of therapy has changed from talking to me about her to interacting with her." Taryn felt that she had more "one-on-one" activities with her daughter. She believed that her practitioner had been "pretty consistent [with] no drastic changes in her coaching" and thought it was "nice that she is consistent on that." Flora identified a mismatch between the data and her personal experience with the intervention, "On paper, it just looks like the intervention wasn't so great, but internally, I feel like it was really great." Flora shared of the data, "Even though I'm using the strategies pretty consistently, I feel like the quality of the use of the strategies changed, but that's hard to quantify." Flora said, "I really think that the family has it in their head that we work at the table because I'm in a computer, so they want to set me on the table. I think it's a little more stilted than if I was at the house." Flora said, "I think the hardest thing is the expectations… having a family know that we're not going to go make pancakes now…These are the expectations before we even start. That's hard for me to lay down the law and then keep it, to keep reminding parents of the expectations." Taryn said she would have liked to have a conversation about roles and expectations with her practitioner in the beginning and that it "would have helped…just to clarify" and help her know if she was doing the right thing during sessions.	encountered difficulties with setting expectations with families during sessions but also reported not having clear, mutual conversations with families about roles and expectations. The parent reported appreciating strategies that helped her support her daughter and provided her with encouragement. She believed that focusing on dyadic interactions during sessions supported her in doing activities with her daughter between sessions. Taryn noticed the practitioner increasing her facilitation of dyadic interactions, corresponding with a marked and stable increase in level midway through intervention. However, she also appreciated that her practitioner made only minor shifts in her practice. Flora believed focusing on dyadic interactions during sessions with both caregivers became easier and "more natural" throughout intervention. Despite minor shifts in strategy use across phases, Flora felt that her practice shifted significantly and was more intentional in her parent coaching. She believed the quality of her work increased.

CHAPTER 5

Discussion

This mixed methods study sought to understand how to improve multiple factors in EI service delivery, including 1) virtual professional development opportunities for EI practitioners of various disciplines, 2) implementation of parent coaching strategies employing a triadic approach, and 3) parent-child outcomes, by way of increased parent-child interactions during EI sessions with their practitioner. As such, this paper contributes to a growing body of literature investigating multiple aspects of EI practice, including professional development in EI (Artman-Meeker et al., 2015; Fettig et al., 2016; Kemp & Turnbull, 2014; Snyder et al., 2015) and supporting practitioners with adopting family-centered, capacity-building approaches in their work with families (Brown & Woods, 2012; Marturana & Woods, 2012; Meadan et al., 2020).

We did this by providing virtual training and ongoing coaching for EI service practitioners in a triadic approach to parent coaching, in addition to recording weekly teleintervention sessions with their participating triad family. Recordings were then used for behavioral coding of practitioners' implementation of triadic strategies and for time spent in parent-child interactions. Interviews were conducted to better understand participants' experiences with and perspectives of the training and use of a set of triadic parent-coaching strategies during EI teleintervention sessions. Triads were matched, allowing for a thorough understanding of parent and practitioner experiences within the specific context of their unique relationship, environment, and supporting factors. Methodological approaches supported this understanding by first using SCRD to employ behavioral observation and coding, followed by one-on-one interviews to elicit participant perspectives of observed sessions. Data were merged to bring together both observed (quantitative) and lived (qualitative) accounts of EI session

activities within and across triads to attempt a comprehensive conception of how EI practitioners can best support parents of young children with disabilities via the mechanism of regular, ongoing service delivery.

Mixing methods allowed us to draw a comprehensive picture of how the intervention activities influenced multiple aspects of EI service delivery. The main findings from this study suggested that: (1) introducing EI practitioners to a virtual training and coaching intervention produced modest, but consistent, increases in practitioner use of triadic strategies during teleintervention sessions; (2) dyads demonstrated overall increased interaction time during sessions after practitioners were introduced to the training and coaching intervention; (3) EI practitioners reported positive experiences with the training and coaching intervention, and believed that it supported their practice; (4) EI practitioners believed incorporating the triadic strategies into sessions benefitted their work with families – both practitioners and parents discussed benefits and barriers to building caregiver capacity, in addition to data reflections; and (5) specific factors may have influenced implementation of triadic strategies and occurrence of dyadic interactions, including the teleintervention context, participant understanding of caregiver and professional roles, and previous practitioner experiences with training and professional experience.

Implications for Practice

Results from this study provide an in-depth look at the mechanisms by which the triadic strategies can support a family-centered approach to early intervention service delivery emphasizing caregiver capacity-building practices. This section will discuss results related to existing literature, with corresponding implications for practice and research.

Implementation of Triadic Strategies

This study investigated to what extent virtual professional training and coaching opportunities increased EI practitioners' use of the triadic strategies. To our knowledge, this is the first study examining a triadic approach using the strategies presented in the PIWI framework (McCollum et al., 2001). We believed that providing didactic training paired with a PBC approach to coaching would support practitioners with increasing their use of strategies. This question was informed solely by quantitative results, namely behavioral observations of weekly teleintervention sessions. Findings from the four participating triads suggested that introducing EI practitioners to a training and weekly coaching intervention produced modest but consistent increases in practitioner use of triadic strategies during teleintervention sessions. This finding was most evident for Phoebe, Beau, and Flora. These findings are consistent with previous research demonstrating increases in practitioners' use of targeted practices after participating in professional development opportunities with virtual training and coaching components (Brown & Woods, 2012; Fettig et al., 2016; Marturana & Woods, 2012; Meadan et al., 2020). However, maintenance data for most practitioners were insufficient to determine if increases in strategy use continued to be present when practitioners were no longer participating in weekly coaching sessions.

While Lauren also showed slight increases in strategy use throughout intervention, we could not confidently claim a functional relation for this practitioner. This is due, in part, to multiple missed EI sessions for this triad throughout intervention, with correspondingly variable and unstable data in this phase. Notably, this triad also worked with an interpreter, as the caregiver and practitioner did not share a preferred language (Vietnamese and English). We observed that a considerable amount of time was devoted to interpreting caregiver and

practitioner speech during their EI sessions, potentially reducing the length and depth of the practitioner's comments. Cheatham (2011) noted that high-quality interpretation in EI service is a significant consideration, and meaningful interpretation takes sufficient time.

Also, the specific strategies practitioners used during sessions changed throughout the study. Based on individual practitioners' use of strategies for each phase, most practitioners demonstrated a higher mean use of AP and FA during intervention compared to baseline, with decreasing use of SU. This shift in strategy use was most prominent for Phoebe, Beau, and Flora. For the six triadic strategies, McCollum and Yates (1994) describe them as being on a continuum, moving from more open-ended, indirect, and unintrusive strategies (ED) to those providing more direct support for dyadic interactions (SU). The authors encourage practitioners to scaffold their support to match the caregiver's strengths, promote caregiver efficacy, and increase caregiver opportunities for learning. With this in mind, we could consider the number of strategies used by practitioners and how they used strategies to support caregivers' outcomes. We will revisit these considerations later in the discussion as we review qualitative findings

Dyadic Interactions

We also queried the relationship between practitioner use of triadic strategies and the amount of time the caregiver and child spent in dyadic interventions. Since the triadic strategies focus on providing practitioners with tools to facilitate developmentally supportive, mutually positive, dyadic interactions, we hypothesized that increased strategy use would lead to more time spent in dyadic interactions. Overall, dyads demonstrated increased time spent interacting after practitioners were introduced to the training and coaching intervention. These findings were consistent with other studies investigating the use of a triadic approach during sessions in which dyadic interactions were differentially affected by practitioner use of strategies (Salisbury &

Cushing, 2013). Additionally, they support previous literature conceptualizing that a triadic approach to service delivery may increase dyadic interactions during sessions (McCollum & Yates, 1994; Mahoney, 2009; Yates, 2011), potentially providing caregivers with more competency-enhancing opportunities (Dunst & Espe-Sherwindt, 2006; Dunst & Trivette, 2009). As might be expected with a secondary variable, these changes to dyadic interaction were not immediate and varied between dyads. Select dyads showed increases within the first two intervention sessions (1 and 3), while Dyads 2 and 4 demonstrated their highest levels during or after their third intervention session. For most of the dyads, their greatest time spent interacting during sessions was observed towards the end of the intervention phase, after practitioners had participated in more coaching sessions. As with practitioners' implementation of strategies, we were unable to determine if higher levels of dyadic interaction were maintained after the intervention phase due to insufficient data.

Practitioner Training and Coaching Experiences

Overall, practitioners reported positive experiences with the virtual training and coaching intervention and believed that participating in weekly virtual coaching sessions strongly supported their strategy use. These findings match research promoting coaching as an adjunct to professional training to improve that practitioner application of newly acquired skills (Joyce & Showers, 2002; Fixsen et al., 2005). Additionally, the virtual context of coaching made it easily accessible to practitioners statewide, regardless of their physical location (Kyzar et al., 2014). Consistent with the Practice-Based Coaching (PBC) framework (Snyder et al., 2015), practitioners engaged in focused observation, reflection and feedback, and shared goals and action planning. Of these coaching components, they most valued opportunities for observation, reflection, and feedback. However, practitioners also noted that these activities, especially the

observation of the video clip from their previous teleintervention session, were accompanied by a level of discomfort. This note of experiencing "necessary discomfort" to improve their practice was echoed among multiple practitioners in the current study. They considered this to be a regular part of the growth process. This perspective of observation as a somewhat uncomfortable experience for practitioners may be unique to virtual self-observation. However, it was not, to our knowledge, reported in the existing literature documenting professionals' experiences with virtual coaching that incorporated observations of session video clips made by coaches (e.g., Fettig et al., 2016; Marturana & Woods, 2012). Also, while practitioners considered action planning a necessary and routine aspect of coaching, some thought this component was less helpful.

In some cases, action planning appeared to support practitioners with their implementation of strategies directly. For instance, Triad 4 demonstrated higher levels of triadic strategy use and dyadic interactions during intervention. Based on the higher level of strategy implementation and dyadic interaction data for this triad, one could suggest that actively engaging in the action planning process by referencing the action plan and applying tools and strategies supported higher strategy use during sessions for Flora. Since action planning is considered an essential component of PBC, we encourage its continued use in coaching activities. We note future considerations for research into action planning later in the discussion.

Participant Perspectives of Using the Triadic Strategies

We sought to understand participants' lived experiences incorporating the triadic strategies to supplement our observations of triads' recorded teleintervention sessions. Overall, practitioners believed the strategies were simple to implement and improved their work with families in multiple ways, targeting families' unique needs. In addition, consistent with literature

promoting capacity-building practices for caregivers, both practitioners and parents found the triadic strategies beneficial for caregiver learning when provided in the context of dyadic interaction (ED) (Dunst & Espe-Sherwindt, 2006; Dunst & Trivette, 2009). The need for EI practitioners to move away from child-centered models of service delivery and align with family-centered approaches prioritizing high-quality, developmentally supportive dyadic interactions is well established in practice guidelines (DEC, 2014; NAEYC, 2011). Facilitating such interactions allows practitioners to provide caregivers with more competency-enhancing learning opportunities (Dunst & Espe-Sherwindt, 2006; Dunst & Trivette, 2009).

Supports and Barriers to Building Caregiver Capacity. Both practitioners and caregivers favored strategies that increased the parent's knowledge and sense of competence to effectively support their child's development in the context of ongoing interactions. Emphasizing dyadic interactions during sessions, supporting caregiver competence and confidence, and providing caregivers with knowledge and tools to effectively support their child's development are consistent with recommendations for EI service delivery (DEC, 2014). In addition, engaging caregivers in capacity-building helpgiving practices positively influences their belief that they can support their child's development and, consequently, promotes high-quality dyadic relationships (Trivette et al., 2010).

In this study, all practitioners recognized the value of a capacity-building, family-centered, triadic approach to some degree and talked about their efforts to involve caregivers during sessions actively. For some practitioners, facilitating caregiver involvement was observed to be more challenging. One practitioner consistently engaged with the child throughout the study period and expressed a belief that caregiver characteristics (e.g., language differences and a lack of confidence) served as barriers to implementing a triadic approach. This dissonance

between recommended service delivery in EI and deficit-based practitioner beliefs has been noted previously in the literature (Sawyer & Campbell, 2009; Fleming et al., 2011; Douglas et al., 2020). Notably, this same practitioner chose to focus her action planning on improving the facilitation of dyadic interactions, resulting in increased time spent in interactions for the dyad during sessions. We will consider the role of training at length later in this chapter.

Data Reflections. Practitioners and caregivers had differential experiences regarding their awareness of strategy implementation. While two of the four practitioners felt that their implementation data aligned with their experience, the other two did not, citing changes in their awareness of their strategy use after the intervention. This observation reflects a fundamental notion underlying the triadic strategies: they encompass behaviors that most EI practitioners likely already incorporate in their sessions. However, by learning about the triadic strategies and the mechanisms by which they support caregivers, practitioners can become increasingly more intentional regarding how, when, and why they use these behaviors in their work with families (McCollum et al., 2001; Yates, 2011). These practitioner reports may also connect to findings showing that most practitioners shifted their practice to increase their use of strategies that scaffolded caregiver learning, potentially promoting caregiver strengths and efficacy (McCollum & Yates, 1994).

This line of inquiry begs an additional question: how much time should practitioners spend focusing on facilitating dyadic interactions during sessions? While this has not yet been determined empirically, research examining the relationship between dyadic interactions, child outcomes, and home visit quality shows promise in approximating a guideline (Hughes-Belding et al., 2019; Raikes et al., 2006). In a study by Hughes-Belding et al. (2019), engagement in triadic strategies with a focus on child-related content (as determined by the Home Visit

Observation Form-Revised [HVOF-R]) was associated with higher home visit quality components in practitioner behavior and family engagement. Raikes et al. (2006) investigated multiple home-visiting components and their effects on child outcomes with families of 36-month-old children from 11 Early Head Start programs nationally. Their findings suggested that positive child outcomes were strongly supported when approximately 60% or more of session time focused on dyadic interactions and child development content.

Conversely, more time spent addressing family issues or relationship building between practitioners and caregivers predicted more negative child outcomes. In the current study, practitioner time spent implementing triadic strategies and time spent in dyadic interaction could reflect session content devoted to dyadic interactions and child development, similar to those measured by Raikes and colleagues (2006). When taken together, time spent focusing on triadic strategies and dyadic interactions reached a threshold of at least 60% of session time during all intervention phase sessions for triads 3 and 4 and select intervention sessions for triads 1 and 2. However, more information is needed to determine potential alignment between session content variables in this study a. In addition, further research is needed to validate Raikes and colleagues' (2006) findings.

Participant Factors Influencing a Triadic Approach

Finally, this study explored factors that may have influenced the implementation of the triadic strategies and participation in dyadic interactions. In addition to the potential effect of this project's intervention activities, several other possible contributing factors surfaced during conversations with participants. These included working with families over teleintervention, roles and relationships between caregivers and practitioners, and practitioners' prior training experiences.

Teleintervention. We observed that Lauren frequently relied on a more child-directed service delivery style during her sessions. Also, she reported feeling less comfortable with teleintervention at the end of the study compared to baseline. Conversely, Beau described how teleintervention helped the caregivers in their triad take on an active role in session activities. Differences in practitioner experiences with and beliefs around teleintervention may have been influenced by multiple factors, such as their prior experiences with service delivery. For example, Lauren had a history of classroom teaching and in-person home visiting while Beau's professional experience only included teleintervention services. The perspectives shared by these two practitioners are consistent with and contribute to the growing research into EI teleintervention service delivery, demonstrating its usefulness with providing more flexible support for caregivers (Ashburner et al., 2016), emphasizing family-centered, capacity-building practices (Meadan et al., 2016; Stredler-Brown, 2017), and impairing child-directed services (Kelso et al., 2009). Additional research into the benefits of teleintervention would benefit the field, especially since programs increasingly regard teleintervention to be necessary for service delivery (Poole et al., 2020; Schiariti & McWilliam, 2021).

Caregiver and Professional Roles. We identified conversations about roles between caregivers and practitioners to be a factor potentially influencing implementation. Such conversations may include a discussion of the rhythm of session activities, how caregivers can take an active role during sessions and why, and what support the practitioner will provide. As discussed previously, conducting sessions with a triadic, family-centered orientation requires that practitioners aim to spend most of each session facilitating positive, developmentally supportive, dyadic interactions. While standards exist for professional responsibilities and roles in EI (DEC, 2014), parents do not have an equivalent source of understandable and accessible information.

As a result, they primarily rely on their EI practitioner or program to uphold professional roles according to recommended practices and to communicate expectations to caregivers. Professionals also need to communicate how practitioners will incorporate capacity-building, caregiver learning opportunities. Communication about roles becomes critically important with a triadic approach to service delivery. Its success hinges on a shared understanding that most session activities focus on dyadic interactions, with the practitioner providing support. If caregiver-practitioner or child-practitioner interactions begin to dominate session time, opportunities are lost for strengthening dyadic relationships and caregiver efficacy through the facilitation of dyadic interactions (Peterson et al., 2012; Raikes et al., 2014). In the current study, most practitioners did not have a clear conversation with caregivers at the beginning of their relationship about their respective roles during sessions or how practitioners would support caregiver learning opportunities. Neglecting to communicate roles and expectations based on recommended practice (DEC, 2014) with families may compromise caregivers' overall sense of confidence and competence during sessions, as they attempt to navigate unfamiliar systems and partnerships (Ishimaru, 2019) during a time of increased vulnerability (Guralnick 1997; 2001). It may also result in caregivers unknowingly settling into interaction patterns emphasizing caregiver-practitioner or child-practitioner interactions, which remain prevalent in EI practice (McBride & Peterson, 2007; Peterson et al., 2007) and was observed, especially during baseline, with Triad 1.

Having a transparent and open conversation about roles and expectations with caregivers at the onset of service delivery can support capacity-building efforts by building a solid working alliance (Halvorath, 2006). This conversation would occur in addition to the IFSP team meeting. However, conducting family-friendly IFSP meetings focusing on family goals and outcomes

would also be essential for supporting working alliance. The one triad in this study who had an initial conversation about roles and expectations consistently spoke positively about their working relationship. The caregiver expressed feeling confident in her understanding of how she and her practitioner would work together. Research suggests that a solid caregiver-professional working alliance is supported when the caregiver has positive expectations of service delivery processes and outcomes (de Greef et al., 2018). Practitioners may shape positive expectations for caregivers by prioritizing conversations detailing a transparent process of how EI sessions will be conducted, how the practitioner and caregiver will communicate in and out of sessions (Henderson, 2007), and how capacity-building practices will facilitate caregiver learning opportunities. Triads can also revisit the shared goals and positive child and family outcomes that they will meet. During these conversations, caregivers are also provided the space to provide feedback regarding process and outcomes, thereby taking an active role in shaping the caregiver-practitioner partnership (Henderson, 2007; Hill & Torres, 2010). Building collaboration may be especially vital for family-practitioner partnerships where the caregiver does not identify with the dominant culture (e.g., White, middle-class values). Using the *cultural posture of reciprocity*, Kalyanpur and Harry (1997) detail how practitioners can engage in open dialogue with culturally diverse caregivers so that both partners may acknowledge their assumptions regarding ability, interventions, and goals as they build their relationship. Caregivers can discuss family cultural and linguistic identities and practices to be prioritized throughout service provision as targets of learning to be sustained (Lee, 2017). To maintain a commitment to trusting and equitable relationships, practitioners must continue to grow in their understanding of family cultural identities and practices, beyond the common topics of accepting food, celebrated holidays, and whether or not to wear shoes in the family's home (Park & Paulick, 2021). When participants in

this study were asked to reflect on the degree to which they shared mutually agreed-upon goals with caregivers (via the Working Alliance prompt in the Demographic and EI Experiences Questionnaire), all but one (Phoebe) indicated no change or an increase in this area at the end of the study compared to the beginning of the study. While we did not prompt practitioners to engage caregivers in conversations around goals, roles, and expectations as a part of this study, increased triadic strategy use may have led to participants feeling a greater sense of confidence and trust in their triad partnerships.

Also, such conversations need to be supported at the program leadership level, as described by DEC Recommended Practice L3: "Leaders develop and implement policies, structures, and practices that promote shared decision making with practitioners and families" (DEC, 2014). Relevant information about roles, expectations, goals of early intervention, and even conflict resolution can be supplied by the agency or center in various family languages and reviewed by the caregiver and practitioner together (Henderson, 2007). Considering the significant amount of paperwork and information families encounter when entering early intervention, this dialogue can and should be revisited during initial EI sessions and throughout ongoing service delivery as needed. Programs onboarding new practitioners or training established EI practitioners to adopt a triadic approach may benefit from supporting practitioners in initiating explicit conversations with caregivers about how their service delivery will focus on supporting dyadic interactions, as well as the rationale for doing so. Shifting to a triadic approach may be easier to establish with new families than with families that practitioners have already established working relationships. In either case, caregivers may benefit from the increased transparency and the opportunity to openly communicate questions, share concerns or comments (Tushnet, 1993), and adapt interventions to their cultural values (Kalyanpur & Harry, 1997).

They may also learn how caregivers and children may benefit from family-centered, capacity-building early intervention practices (Espe-Sherwindt, 2008).

Practitioner Training. Another potentially influencing factor was that of practitioners' training and education. Each practitioner reported varying background experiences. Personnel preparation standards in EI and ECSE outline the need for preservice training in partnering with families and using responsive and reciprocal interactions, interventions, and instructions (CEC & DEC, 2020). While understanding the availability and usefulness of various interventions for supporting child development is necessary, it is also essential that practitioners know how to transfer this information to caregivers and support them in adapting and implementing strategies with their children.

When preservice training lacks information targeting the implementation of family-centered capacity-building practices for caregivers, professional development can fill this gap. However, practitioners described brief professional development experiences that often lacked opportunities for the application of learning. These reports are consistent with previous research suggesting that practitioner preparation programs and professional development opportunities are often limited (Bruder, 2010) and lead to EI practitioners feeling insufficiently prepared to work with both caregivers and children during sessions (Bruder et al., 2013). Professional development training may have been crucial for a practitioner like Lauren, whose education and previous experience centered around classroom teaching. Flora described professional development opportunities in caregiver coaching that were broad and hard to apply in her sessions with families. However, she found the triadic strategies simple enough to understand and easy to incorporate into her sessions. While professional organizations provide detailed practice recommendations (e.g., DEC, 2014), Ozdemir (2007) suggested that practitioners lack

clear guidance regarding implementing family-centered practices with families. Understanding how to offer encouragement and positive feedback to support caregiver competence, provide developmental information about their child, and help caregivers understand child cues, are critical skills for supporting caregiver capacity. In addition to learning about the foundations of a family-centered approach, EI practitioners representing a variety of disciplines must receive training and coaching in simple tools, such as the triadic strategies, to support the application of capacity-enhancing practices to home visit and teleintervention settings (page 11). Without such opportunities, many practitioners may lack the considerable skill to develop a productive working alliance with caregivers and engage them in developmentally supportive interactions with their children (Roggman et al., 2016).

Limitations and Additional Implications for Research

There are limitations to note for this study. As with all applied research, there are added complexities when investigating professionals working in the field and caregivers of young children with busy lives and family priorities. While the resulting insight into participants' daily contexts and activities can be a strength of applied research, it can also present multiple challenges. For the current study, all research activities occurred during the COVID-19 pandemic. During this time, many families prioritized their health, safety, and livelihoods, and family-support professionals were navigating increased caseloads, new technology, and additional public health measures (Jones, 2020). In light of these challenges, we were exceedingly grateful for the participation of our eight caregivers and practitioners. Participants were experiencing extra strains in their personal and professional lives, which spilled over into the current project. Factors due to COVID-19 affected our participants differentially. For instance, sometimes teleintervention sessions were canceled when caregivers and practitioners

had to stay home with their child due to daycare closures and quarantines or attend additional doctor appointments. Other participants had changes in job status. For others, there was little change related to these circumstances. While COVID issues may have provided more complications for study activities, research in EI is often dynamic and unpredictable.

Service Delivery

Due to the virtual climate necessitated by the pandemic, all research activities occurred via videoconferencing platforms, including family EI sessions. This exclusive focus on teleintervention services allowed us to examine participant experiences with the triadic strategies delivered in a teleintervention setting only. Teleintervention is thought to support EI practitioners and caregivers with promoting a family-centered approach (Behl et al., 2017; Olsen, 2012). The current study suggests a positive relationship between practitioner use of triadic strategies and time spent in dyadic interaction during EI teleintervention sessions. However, the literature investigating the efficacy of a triadic approach to service delivery remains limited in virtual and in-person settings (e.g., Salisbury & Cushing, 2013). Further research examining EI practitioners' use of triadic strategies with families they see in-person would contribute to our knowledge of how these strategies support dyadic interactions in home and community environments. Such inquiries are critical as programs adjust their policies to return EI service delivery to in-person and hybrid formats.

Furthermore, questions remain regarding other aspects of EI service delivery using a triadic approach. As mentioned earlier, we need to understand more about the appropriate dosage of triadic strategies during EI sessions to promote positive child and family outcomes. More specific information in this area could guide the field in understanding how EI practitioners could best structure their session time to include multiple aspects, including dyadic interactions,

caregiver-practitioner rapport building, and caregiver issues (Raikes et al., 2006). A related line of inquiry might lead us to wonder, how can practitioners best tailor their strategy selection to meet the caregiver's needs? Which of the triadic strategies are most or least supportive of enhancing caregiver capacity? Additional research examining how practitioners scaffold the triadic strategies could help us understand how both the quality and quantity of strategies must be considered in tandem.

Session Frequency

Another limitation was the frequency of data collection. While the frequency of EI sessions for families will vary depending on their IFSP, they can often expect to see a practitioner monthly, weekly, or somewhere in between. We asked practitioners to include children and families they planned to see weekly instead of monthly or biweekly for the current study. We embedded data collection into previously established family-professional relationships. Collecting weekly data allowed us to gather data once per week, per triad, excepting missed weeks due to cancelations, technical difficulties (e.g., the video recording from their session would not upload), or scheduling issues. However, only including families receiving weekly sessions also excluded many triads from participating in this study. Many practitioners saw reductions in session frequency with the introduction of virtual EI sessions. Also, scheduling changes were common within triads. While we were sometimes aware of upcoming schedule changes affecting data collection, this was often not the case. Collecting one data point per week (or less) from weekly sessions resulted in phase change decisions that we may have made differently with more readily available data. For instance, despite aiming for five data points per triad per phase, Triad 1 has only four data points for baseline. Also, we hoped to have three consecutive data points for a triad before moving to a new phase. However, Triad 3

had only two consecutive data points for intervention before moving to maintenance. After one session in maintenance, the family needed to make schedule changes that precluded additional data collection for this triad. Similarly, Triad 4 had only two consecutive data points for baseline before introducing the practitioner to intervention procedures. While sticking to established phase change conventions (WWC, 2020) may have strengthened the data, we made decisions based on the need to move forward with the study and honor participant needs.

However, families often see each EI practitioner biweekly or monthly. Thus, future research with a longer timeline may benefit the field by investigating different session frequency or intensity levels related to recommended practices. In addition, it may be helpful to explore the most efficient way to serve families in EI with less time and fewer resources. In this case, we might examine the most effective practices for families, how reliably practitioners implement newly acquired skills with less frequent observations, or the impact on dyadic interactions. Two practitioners in this current study noted this line of inquiry. Each expressed their interest in learning more about incorporating capacity-building practices that could support children and families they saw less frequently.

Training

In response to our previous discussion points, we believe future research could consider multiple training and coaching factors, such as the mode of delivery. For example, the current study relied solely on virtual service delivery and professional development opportunities, both out of necessity and interest. While this allowed for statewide recruitment and access, investigations into in-person training and coaching, or hybrid options, could further our understanding of virtual versus in-person professional development efficacy. Live professional development opportunities may benefit local programs planning to train EI practitioners within

an agency or county and who have options for PD delivery mode. For example, comparisons could be made between live observations and recorded observations viewed with (as in the current study) or without the coach and in vivo coaching and reflective coaching.

Similarly, we would encourage future projects to examine further the multiple intervention components used in this study. Of particular interest were participants' responses to the usefulness of action planning. While our participants expressed mixed experiences with this component, action planning is essential in PBC (Snyder et al., 2015). In their research exploring action planning for medical patients, Lorig et al. (2014) found that action planning supported patients with follow-through of self-management programs, leading to greater health and self-efficacy. We believe that future research could be conducted in EI/ESCE investigating how practitioners can effectively engage in action planning to meet their goals and increase their use of recommended practices. Involving caregivers in the action planning process may further support practitioner implementation and improve practitioner-caregiver collaboration and teaming.

Additionally, we noted that practitioners had differential experiences with coaching components (such as action planning) somewhat related to their engagement in the coaching process. Practitioners appeared to demonstrate varying levels of initiative in translating coaching supports to practice. We believe it would be highly worthwhile to consider how scaffolding coaching could support strategy implementation for EI practitioners. For instance, EI practitioners may benefit from tiered coaching models demonstrated in recent literature for preschool educators (Artman-Meeker et al., 2021).

Mixed Methods

To our knowledge, there are no published mixed methods studies incorporating both qualitative and single-case research design components as we did in the current study. There are limited single-case mixed methods studies present in the literature. However, these primarily focus on single participant case studies and exist outside the field of education (e.g., Ramos & Ramos, 2019). Unlike the current study, they do not appear to conform to WWC standards and guidelines (WWC, 2020). Onghena and colleagues (2019) described this approach, which they call mixed methods single-case research (MMSCR), and define as "research in which single case experimental and qualitative case study methodologies, and their accompanying sets of methods and techniques, are integrated to answer research questions that concern one case" (Onghena et al., 2019, p. 462).

Single case research has a history of incorporating participant perspectives about multiple study components in social validity data (Wolf, 1978). The original intent of collecting social validity data was to validate the social significance of the research goals, the social appropriateness of procedures, and the social importance of its effects. Many years later, researchers continue to collect social validity data to examine an intervention's effectiveness, but the rigor of many social validity data collection methods has been scrutinized (Snodgrass et al., 2018; Snodgrass et al., 2021). We will not provide a thorough analysis of social validity and how it compares to qualitative interview data—utilizing rigorous qualitative data analysis procedures in the current study allowed for a thorough understanding of participant perspectives of research goals, procedures, and significance. In addition, we aimed to gain a more nuanced view of the contextual factors related to intervention and implementation procedures and findings by conducting interviews. We believe mixed methods research could continue to explore

perspectives of multiple stakeholders (including families, practitioners, program leaders, and policymakers) regarding the training and use of capacity-building practices in EI service delivery while examining varied intervention components.

Further investigations into the implementation of triadic strategies, paired with EI session quality measures (e.g., HOVRS), and qualitative data, could also provide a more comprehensive look at the current study's research questions. Additionally, incorporating measures investigating child-level outcomes could substantially move this work forward by demonstrating relations between practitioner behaviors, dyadic interactions, and children's skill development. Thus, we are hopeful that the continued use of a range of mixed methods procedures in EI research can continue to improve child and family outcomes in the field of EI.

Conclusion

In conclusion, enhancing caregivers' capacity to feel confident and competent in positively influencing their child's development is essential to supporting positive child and family outcomes and is a primary aim in EI service delivery. This study aimed to contribute to the existing EI literature examining capacity-building practices in ongoing EI service delivery. Critically, we also investigated the efficacy of a training and coaching intervention for supporting practitioner use of strategies and consequent changes in time spent in dyadic interactions. A mixed methods research design allowed for a more thorough understanding of the intervention's effects than collecting quantitative or qualitative data in isolation. We hope that our findings extend the field's knowledge of one approach EI practitioners can use in their regular sessions with children and families to positively affect caregiver self-efficacy and dyadic relationships. We believe that providing practitioners with simple, applicable methods for enhancing child and family outcomes is crucial. Our field continues to struggle with widespread

acknowledgments

acceptance and adoption of a family-centered approach to EI. We are grateful for the caregivers, practitioners, research assistants, colleagues, and advisors who came together to help make this project happen, and I am hopeful that with ongoing education and research, the field of EI can continue to work towards fulfilling its promise for families and their young children.

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Appendix A

Practitioner Demographic & EI Experiences Questionnaire

COLLEGE OF EDUCATION
UNIVERSITY of WASHINGTON

Educator Background

1. Name:
2. What is the highest level of education you have completed? ***Please mark ONLY one.***
   - ☐ Less than high school, no GED
   - ☐ High school diploma or GED
   - ☐ Some college, but no degree
   - ☐ Associate of Arts Degree (A.A.)
   - ☐ Bachelor's Degree (B.A/B.S.)
   - ☐ Graduate school, but no degree
   - ☐ Graduate degree (M.A./M.S.)
   - ☐ Graduate or professional degree beyond a master's (Ph.D., M.D., J.D., Ed.D.)
3. Do you hold any of the following: in-state/out-of-state teaching or educator certificate, BCBA, Infant Mental Health Certificate, administrator certificate?
   ☐ Yes ☐ No

   If yes, specify your certification (check all that apply)
   - ☐ Administrator Certificate
   - ☐ BCBA
   - ☐ Infant Mental Health Certificate
   - ☐ Other: _____
4. How many years have you worked in the field of early intervention? _____ year(s)
5. How many years have you worked in in this program/center/agency? _____ year(s)
6. What category below best describes your ethnicity? ***Please mark <u>ONLY</u> one.***
   - ☐ American Indian or Alaska Native
   - ☐ Asian/ Native Hawaiian or Pacific Islander
   - ☐ Black/African-American
   - ☐ White/European-American
   - ☐ Multi-racial
   - ☐ Other
7. Are you of Hispanic/Latino origin? ☐ Yes ☐ No
8. What is your gender? ☐ Female ☐ Male ☐ Other

9. What is your annual income?

☐ $ 5,000 or less	☐ $ 5,001 to $ 10,000	☐ $ 10,001 to $ 15,000	☐ $ 15,001 to $ 20,000
☐ $ 20,001 to $ 25,000	☐ $ 25,001 to $ 30,000	☐ $ 30,001 to $ 35,000	☐ $ 35,001 to $ 40,000
☐ $ 40,001 to $ 50,000	☐ $ 50,001 to $ 75,000	☐ $ 75,001 or more	

10. Do you provide services in a language other than English?

☐ Yes (list languages) ☐ No

_____

---

11. How many hours **per week** are you paid to work in the current program?_____ hour(s)

12. How many families and children do you currently serve? _____

13. How comfortable do you feel working with families in home contexts?

1	**2**	**3**	**4**	**5**
Not Comfortable				Very Comfortable

14. How comfortable do you feel supporting families via teleintervention?

1	**2**	**3**	**4**	**5**
Not Comfortable				Very Comfortable

15. How much do you agree with the following statement?

"Parents and I are working towards mutually agreed upon goals."

1	**2**	**3**	**4**	**5**
Definitely Disagree				Definitely Agree

16. How do you prefer to involve families during teleintervention sessions? ***Please mark ONLY one.***

☐ I prefer that caregivers are not present when working with the child who receives early intervention services.

☐ I prefer families observe my work with the child.

☐ I prefer to explain what I am doing during work with the child.

☐ I prefer to show or demonstrate how to do the interventions with the child.

☐ I prefer to involve caregivers in a way where they can continue to do the interventions without my ongoing assistance.

17. What challenges do you encounter when supporting families and young children via teleintervention?

_____

_____

_____

_____

_____

_____

Appendix B

Family Demographic & EI Experiences Questionnaire

COLLEGE OF EDUCATION
UNIVERSITY of WASHINGTON

Educator Background

1. Name:

2. What is the highest level of education you have completed? ***Please mark ONLY one.***

- ☐ Less than high school, no GED
- ☐ High school diploma or GED
- ☐ Some college, but no degree
- ☐ Associate of Arts Degree (A.A.)
- ☐ Bachelor's Degree (B.A/B.S.)
- ☐ Graduate school, but no degree
- ☐ Graduate degree (M.A./M.S.)
- ☐ Graduate or professional degree beyond a master's (Ph.D., M.D., J.D., Ed.D.)

3. What is your relationship to your child?

- ☐ Mother
- ☐ Father
- ☐ Grandparent
- ☐ Other:

4. What is your gender? ☐ Female ☐ Male ☐ Other

5. What is your child's gender? ☐ Female ☐ Male ☐ Other

6. What category below best describes your ethnicity? ***Please mark <u>ONLY</u> one.***

- ☐ American Indian or Alaska Native
- ☐ Asian/ Native Hawaiian or Pacific Islander
- ☐ Black/African-American
- ☐ White/European-American
- ☐ Multi-racial
- ☐ Other

7. Are you of Hispanic/Latino origin? ☐ Yes ☐ No

8. What is your annual income?

- ☐ $ 5,000 or less
- ☐ $ 5,001 to $ 10,000
- ☐ $ 10,001 to $ 15,000
- ☐ $ 15,001 to $ 20,000
- ☐ $ 20,001 to $ 25,000
- ☐ $ 25,001 to $ 30,000
- ☐ $ 30,001 to $ 35,000
- ☐ $ 35,001 to $ 40,000
- ☐ $ 40,001 to $ 50,000
- ☐ $ 50,001 to $ 75,000
- ☐ $ 75,001 or more

9. What languages are spoken in your home?

_____

10. How many years have you and your child received EI services? _____ year(s)

11. What EI services are you currently receiving?

_____

12. How comfortable do you feel receiving early intervention services via teleintervention?

1	**2**	**3**	**4**	**5**
Not Comfortable				Very Comfortable

13. How much do you agree with the following statement?

"Our EI practitioner and I are working towards mutually agreed upon goals."

1	**2**	**3**	**4**	**5**
Definitely Disagree				Definitely Agree

14. Which of the following best describes how you are involved with teleintervention visits? ***Please mark <u>ONLY</u> one.***

☐ I am not present when my child receives early intervention services.

☐ I only observe the service provider working with my child.

☐ The service provider explains what they are doing with my child.

☐ The service provider shows me or demonstrates how to do the intervention with my child.

☐ The service provider involves me in a way where I can continue to do the interventions without the provider's ongoing assistance.

15. What challenges do you encounter when receiving early intervention services via teleintervention?

_____

_____

_____

_____

_____

_____

Appendix C

PIWI Strategies Coding Sheet

VIDEO NAME:

VIDEO LENGTH: *Start Time End Time Total Minutes*

CODER NAME: **Date:**

Event Sampling – Code Every 10 seconds. Mark the box when a triadic strategy was used

Interval	**0:00-0:09**	**0:10-0:19**	**0:20-0:29**	**0:30-0:39**	**0:40-0:49**	**0:50-0:59**	**1:00-1:09**	**1:10-1:19**	**1:20-1:29**	**1:30-1:39**	**1:40-1:49**	**1:50-1:59**
Code												

Interval	**2:00-2:09**	**2:10-2:19**	**2:20-2:29**	**2:30-2:39**	**2:40-2:49**	**2:50-2:59**	**3:00-3:09**	**3:10-3:19**	**3:20-3:29**	**3:30-3:39**	**3:40-3:49**	**3:50-3:59**
Code												

Interval	**4:00-4:09**	**4:10-4:19**	**4:20-4:29**	**4:30-4:39**	**4:40-4:49**	**4:50-4:59**	**5:00-5:09**	**5:10-5:19**	**5:20-5:29**	**5:30-5:39**	**5:40-5:49**	**5:50-5:59**
Code												

Interval	**6:00-6:09**	**6:10-6:19**	**6:20-6:29**	**6:30-6:39**	**6:40-6:49**	**6:50-6:59**	**7:00-7:09**	**7:10-7:19**	**7:20-7:29**	**7:30-7:39**	**7:40-7:49**	**7:50-7:59**
Code												

Interval	**8:00-8:09**	**8:10-8:19**	**8:20-8:29**	**8:30-8:39**	**8:40-8:49**	**8:50-8:59**	**9:00-9:09**	**9:10-9:19**	**9:20-9:29**	**9:30-9:39**	**9:40-9:49**	**9:50-9:59**
Code												

Interval	**10:00-10:09**	**10:10-10:19**	**10:20-10:29**	**10:30-10:39**	**10:40-10:49**	**10:50-10:59**	**11:00-11:09**	**11:10-11:19**	**11:20-11:29**	**11:30-11:39**	**11:40-11:49**	**11:50-11:59**
Code												

Interval	12:00-12:09	12:10-12:19	12:20-12:29	12:30-12:39	12:40-12:49	12:50-12:59	13:00-13:09	13:10-13:19	13:20-13:29	13:30-13:39	13:40-13:49	13:50-13:59
Code												

Interval	14:00-14:09	14:10-14:19	14:20-14:29	14:30-14:39	14:40-14:49	14:50-14:59	15:00-15:09	15:10-15:19	15:20-15:29	15:30-15:39	15:40-15:49	15:50-15:59
Code												

Interval	16:00-16:09	16:10-16:19	16:20-16:29	16:30-16:39	16:40-16:49	16:50-16:59	17:00-17:09	17:10-17:19	17:20-17:29	17:30-17:39	17:40-17:49	17:50-17:59
Code												

Interval	18:00-18:09	18:10-18:19	18:20-18:29	18:30-18:39	18:40-18:49	18:50-18:59	19:00-19:09	19:10-19:19	19:20-19:29	19:30-19:39	19:40-19:49	19:50-19:59
Code												

Interval	20:00-20:09	20:10-20:19	20:20-20:29	20:30-20:39	20:40-20:49	20:50-20:59	21:00-21:09	21:10-21:19	21:20-21:29	21:30-21:39	21:40-21:49	21:50-21:59
Code												

Interval	22:00-22:09	22:10-22:19	22:20-22:29	22:30-22:39	22:40-22:49	22:50-22:59	23:00-23:09	23:10-23:19	23:20-23:29	23:30-23:39	23:40-23:49	23:50-23:59
Code												

Interval	24:00-24:09	24:10-24:19	24:20-24:29	24:30-24:39	24:40-24:49	24:50-24:59	25:00-25:09	25:10-25:19	25:20-25:29	25:30-25:39	25:40-25:49	25:50-25:59
Code												

Interval	26:00-26:09	26:10-26:19	26:20-26:29	26:30-26:39	26:40-26:49	26:50-26:59	27:00-27:09	27:10-27:19	27:20-27:29	27:30-27:39	27:40-27:49	27:50-27:59
Code												

Interval	28:00-28:09	28:10-28:19	28:20-28:29	28:30-28:39	28:40-28:49	28:50-28:59	29:00-29:09	29:10-29:19	29:20-29:29	29:30-29:39	29:40-29:49	29:50-29:59
Code												

Interval	30:00-30:09	30:10-30:19	30:20-30:29	30:30-30:39	30:40-30:49	30:50-30:59	31:00-31:09	31:10-31:19	31:20-31:29	31:30-31:39	31:40-31:49	31:50-31:59
Code												

Interval	32:00-32:09	32:10-32:19	32:20-32:29	32:30-32:39	32:40-32:49	32:50-32:59	33:00-33:09	33:10-33:19	33:20-33:29	33:30-33:39	33:40-33:49	33:50-33:59
Code												

Interval	34:00-34:09	34:10-34:19	34:20-34:29	34:30-34:39	34:40-34:49	34:50-34:59	35:00-35:09	35:10-35:19	35:20-35:29	35:30-35:39	35:40-35:49	35:50-35:59
Code												

Interval	36:00-36:09	36:10-36:19	36:20-36:29	36:30-36:39	36:40-36:49	36:50-36:59	37:00-37:09	37:10-37:19	37:20-37:29	37:30-37:39	37:40-37:49	37:50-37:59
Code												

CODE

 # Intervals Coded: _____

 # Intervals with Triadic Strategies: _____

% Intervals with Triadic Strategies: _____

NOTES:

Appendix D

Dyadic Interactions Coding Sheet

VIDEO NAME: _____

VIDEO LENGTH: *Total Minutes* _____

CODER NAME: _____ **Date:** _____

Event Sampling – Code Every 10 seconds. Mark the box when a triadic strategy was used

Interval	**0:00-0:09**	**0:10-0:19**	**0:20-0:29**	**0:30-0:39**	**0:40-0:49**	**0:50-0:59**	**1:00-1:09**	**1:10-1:19**	**1:20-1:29**	**1:30-1:39**	**1:40-1:49**	**1:50-1:59**
Code												

Interval	**2:00-2:09**	**2:10-2:19**	**2:20-2:29**	**2:30-2:39**	**2:40-2:49**	**2:50-2:59**	**3:00-3:09**	**3:10-3:19**	**3:20-3:29**	**3:30-3:39**	**3:40-3:49**	**3:50-3:59**
Code												

Interval	**4:00-4:09**	**4:10-4:19**	**4:20-4:29**	**4:30-4:39**	**4:40-4:49**	**4:50-4:59**	**5:00-5:09**	**5:10-5:19**	**5:20-5:29**	**5:30-5:39**	**5:40-5:49**	**5:50-5:59**
Code												

Interval	**6:00-6:09**	**6:10-6:19**	**6:20-6:29**	**6:30-6:39**	**6:40-6:49**	**6:50-6:59**	**7:00-7:09**	**7:10-7:19**	**7:20-7:29**	**7:30-7:39**	**7:40-7:49**	**7:50-7:59**
Code												

Interval	**8:00-8:09**	**8:10-8:19**	**8:20-8:29**	**8:30-8:39**	**8:40-8:49**	**8:50-8:59**	**9:00-9:09**	**9:10-9:19**	**9:20-9:29**	**9:30-9:39**	**9:40-9:49**	**9:50-9:59**
Code												

Interval	**10:00-10:09**	**10:10-10:19**	**10:20-10:29**	**10:30-10:39**	**10:40-10:49**	**10:50-10:59**	**11:00-11:09**	**11:10-11:19**	**11:20-11:29**	**11:30-11:39**	**11:40-11:49**	**11:50-11:59**
Code												

Interval	12:00-12:09	12:10-12:19	12:20-12:29	12:30-12:39	12:40-12:49	12:50-12:59	13:00-13:09	13:10-13:19	13:20-13:29	13:30-13:39	13:40-13:49	13:50-13:59
Code												

Interval	14:00-14:09	14:10-14:19	14:20-14:29	14:30-14:39	14:40-14:49	14:50-14:59	15:00-15:09	15:10-15:19	15:20-15:29	15:30-15:39	15:40-15:49	15:50-15:59
Code												

Interval	16:00-16:09	16:10-16:19	16:20-16:29	16:30-16:39	16:40-16:49	16:50-16:59	17:00-17:09	17:10-17:19	17:20-17:29	17:30-17:39	17:40-17:49	17:50-17:59
Code												

Interval	18:00-18:09	18:10-18:19	18:20-18:29	18:30-18:39	18:40-18:49	18:50-18:59	19:00-19:09	19:10-19:19	19:20-19:29	19:30-19:39	19:40-19:49	19:50-19:59
Code												

Interval	20:00-20:09	20:10-20:19	20:20-20:29	20:30-20:39	20:40-20:49	20:50-20:59	21:00-21:09	21:10-21:19	21:20-21:29	21:30-21:39	21:40-21:49	21:50-21:59
Code												

Interval	22:00-22:09	22:10-22:19	22:20-22:29	22:30-22:39	22:40-22:49	22:50-22:59	23:00-23:09	23:10-23:19	23:20-23:29	23:30-23:39	23:40-23:49	23:50-23:59
Code												

Interval	24:00-24:09	24:10-24:19	24:20-24:29	24:30-24:39	24:40-24:49	24:50-24:59	25:00-25:09	25:10-25:19	25:20-25:29	25:30-25:39	25:40-25:49	25:50-25:59
Code												

Interval	26:00-26:09	26:10-26:19	26:20-26:29	26:30-26:39	26:40-26:49	26:50-26:59	27:00-27:09	27:10-27:19	27:20-27:29	27:30-27:39	27:40-27:49	27:50-27:59
Code												

Interval	28:00-28:09	28:10-28:19	28:20-28:29	28:30-28:39	28:40-28:49	28:50-28:59	29:00-29:09	29:10-29:19	29:20-29:29	29:30-29:39	29:40-29:49	29:50-29:59
Code												

Interval	30:00-30:09	30:10-30:19	30:20-30:29	30:30-30:39	30:40-30:49	30:50-30:59	31:00-31:09	31:10-31:19	31:20-31:29	31:30-31:39	31:40-31:49	31:50-31:59
Code												

Interval	32:00-32:09	32:10-32:19	32:20-32:29	32:30-32:39	32:40-32:49	32:50-32:59	33:00-33:09	33:10-33:19	33:20-33:29	33:30-33:39	33:40-33:49	33:50-33:59
Code												

Interval	34:00-34:09	34:10-34:19	34:20-34:29	34:30-34:39	34:40-34:49	34:50-34:59	35:00-35:09	35:10-35:19	35:20-35:29	35:30-35:39	35:40-35:49	35:50-35:59
Code												

Interval	36:00-36:09	36:10-36:19	36:20-36:29	36:30-36:39	36:40-36:49	36:50-36:59	37:00-37:09	37:10-37:19	37:20-37:29	37:30-37:39	37:40-37:49	37:50-37:59
Code												

Interval	38:00-38:09	38:10-38:19	38:20-38:29	38:30-38:39	38:40-38:49	38:50-38:59	39:00-39:09	39:10-39:19	39:20-39:29	39:30-39:39	39:40-39:49	39:50-39:59
Code												

Interval	40:00-40:09	40:10-40:19	40:20-40:29	40:30-40:39	40:40-40:49	40:50-40:59	41:00-41:09	41:10-41:19	41:20-41:29	41:30-41:39	41:40-41:49	41:50-41:59
Code												

Interval	42:00-42:09	42:10-42:19	42:20-42:29	42:30-42:39	42:40-42:49	42:50-42:59	43:00-43:09	43:10-43:19	43:20-43:29	43:30-43:39	43:40-43:49	43:50-43:59
Code												

Interval	44:00-44:09	44:10-44:19	44:20-44:29	44:30-44:39	44:40-44:49	44:50-44:59	45:00-45:09	45:10-45:19	45:20-45:29	45:30-45:39	45:40-45:49	45:50-45:59
Code												

Interval	46:00-46:09	46:10-46:19	46:20-46:29	46:30-46:39	46:40-46:49	46:50-46:59	47:00-47:09	47:10-47:19	47:20-47:29	47:30-47:39	47:40-47:49	47:50-47:59
Code												

Interval	48:00-48:09	48:10-48:19	48:20-48:29	48:30-48:39	48:40-48:49	48:50-48:59	49:00-49:09	49:10-49:19	49:20-49:29	49:30-49:39	49:40-49:49	49:50-49:59
Code												

Interval	50:00-50:09	50:10-50:19	50:20-50:29	50:30-50:39	50:40-50:49	50:50-50:59	51:00-51:09	51:10 51:19	51:20-51:29	51:30-51:39	51:40-51:49	51:50-51:59
Code												

Interval	52:00-52:09	52:10-52:19	52:20-52:29	52:30-52:39	52:40-52:49	52:50-52:59	53:00-53:09	53:10-53:19	53:20-53:29	53:30-53:39	53:40-53:49	53:50-53:59
Code												

Interval	54:00-54:09	54:10-54:19	54:20-54:29	54:30-54:39	54:40-54:49	54:50-54:59	55:00-55:09	55:10-55:19	55:20-55:29	55:30-55:39	55:40-55:49	55:50-55:59
Code												

Interval	56:00-56:09	56:10-56:19	56:20-56:29	56:30-56:39	56:40-56:49	56:50-56:59	57:00-57:09	57:10-57:19	57:20-57:29	57:30-57:39	57:40-57:49	57:50-57:59
Code												

Interval	58:00-58:09	58:10-58:19	58:20-58:29	58:30-58:39	58:40-58:49	58:50-58:59	59:00-59:09	59:10-59:19	59:20-59:29	59:30-59:39	59:40-59:49	59:50-59:59
Code												

CODE

 # Intervals Coded: _____

 # Intervals with Dyadic Interactions: _____

% Intervals with Dyadic Interactions: _____

NOTES:

Appendix E

Practitioner Interview Guide

Thanks again for making the time to talk today. We've been working together for many months now, but just to reintroduce myself a bit, I'm the lead researcher on this project. I am a doctoral student at the University of Washington and before coming to school for my PhD, I was an early intervention special educator for many years at an agency in Seattle called Boyer Children's Clinic.

For this project we provided training and coaching to you in a certain set of parent coaching strategies. I'm going to start this interview by asking you questions about your general thoughts on EI, then we'll talk more specifically about your experiences with this project, and finally we'll review the data together.

I know we've worked together for some months, but I'm really interested in knowing what didn't work for you or what did work. Most of the activities from this project were based on protocols found in research, so your input as a practitioner is very valuable.

I'm expecting that we'll be talking for 45-60 minutes today. Do you have any questions before we begin?

I'll be recording this interview. Can I begin?

1. **Broad reflection on EI**
   We're going to start broadly by talking about your overall thoughts about EI, your experiences working in EI and with working with your family. I'll be asking questions throughout the interview, but please let me know if any of them are unclear so I can reword them.
   a. We often talk about using a parent coaching model in EI. What does parent coaching mean to you? What happens during parent coaching? *For both in-person and tele, if applicable.*
      i. Probe: how do you involve the parent and/or child in parent coaching?
   b. What is your goal in EI?
      i. How do you prioritize parent coaching and family-centered practice in your visits?
   c. Tell me how you talk with parents about their role during sessions/visits and your role.
      i. *Probe: have you had to revisit that conversation? How did it go when you had to have that conversation with a family who wanted you to work one-on-one with the child.*
   d. (Painting a perfect picture of EI) Think about a time – anytime – when your session went really well or something during the session went really well. What happened? What did that look like? (consider making this just about the project)

2. **Reflection on experience with the intervention**
   Thank you. Now I'm going to ask you some questions that are more specific to the project and your experience with incorporating triadic parent coaching strategies over the last six months.
   a. Thinking about your family, walk me through a typical teleintervention visit with them before you started the project.
      i. How did that change when we started training and coaching?
   b. What went really well for you with using triadic strategies during sessions?
      i. Which of the strategies did you find to be most useful in your sessions [review strategies as needed] or what was a helpful combo?
         1. Which felt most comfortable for you to incorporate?
         2. Tell me about a time when this strategy was helpful.
   c. Tell me about your experience with trying to support parent-child interactions during sessions.
      i. *Probe*: How did using triadic strategies and focusing on parent child interactions improve your sessions?
      ii. *Probe*: How did they improve your coaching skills?
      iii. How did using them benefit families?
         1. What progress have the family and child made in the last couple of months? What does that progress look like?
   d. What challenges or barriers did you experience with using triadic strategies?
      i. What were some barriers you experienced with facilitating parent-child interactions?
      ii. How did you balance talking/delivering strategies with making time and space for parent-child interactions?
   e. Are you incorporating strategies on your caseload broadly?

3. **Reflection on data**
   Throughout this project, we've been collecting various forms of data, starting with the questionnaire you completed back in January. We've also been watching the videos you recorded and counting a couple of things. For one, we've been counting how often you use the triadic strategies we've been talking about in training and coaching. We've also been keeping track of how often the parent and child interact with each other (smile at each other, play together, talk to each other, etc.). I'm going to show you some of the data and I'm curious to hear your thoughts about it.
   a. First let's talk about the questionnaire. (Look at survey #14)
      i. You indicated_____ (e.g., "I prefer to involve families in a way where they can continue to do the interventions without my ongoing assistance.") Walk me through how you do this.
   b. Now we're going to look at a data graph. (Show them the graph, explain how it works, and ask for questions.)
      i. Remark on it: I noticed that…..(there is a big increase in strategies used between x and y. OR based on data you used more suggest than model.)
   c. What influenced these changes? What influenced your choice of strategies here?
   d. Are you surprised by this data or is this what you would have expected to see? Why?

4. **Reflections on coaching**
   Now we're going to talk about the training and coaching process more specifically. During coaching, we debriefed the previous session, reviewed action plans, watched a clip, you reflected, I provided feedback, and we did action planning for the next session.
   a. Which components were most useful for you?
   b. Which components did not work for you?
   c. What would you add to the coaching format to improve it? (Bug-in-ear, change frequency, group, etc.)
   d. If you could receive any kind of training/coaching/support, what would that look like?
      i. What would you want to learn more about?
      ii. What would be the best format/setting?

5. **Closing**
   a. What would you like to tell me that I haven't asked you about?
   b. Thank you for your time. I am going to email you a gift card to thank you for participating in this interview. Would you like me to use the email we used for scheduling?

Appendix F

Caregiver Interview Guide

Thanks again for making the time to talk today. We met earlier in the year, but just as a reminder, my name is Shawna and I'm the lead researcher on this project. I am a doctoral student at the University of Washington and before coming to school for my PhD, I was an early intervention special educator for many years at an agency in Seattle called Boyer Children's Clinic. I am also a mother of two children who may very well pop in at some point.

For this project we provided training and coaching to your practitioner in a certain set of parent coaching strategies. I'm going to start this interview by asking you questions about your general thoughts on EI and then talk more specifically about this project and what we did as a part of it.

I'm expecting that we'll be talking for 45-60 minutes today. Do you have any questions before we begin?

I'll be recording this interview. Can I begin?

1. **Broad reflections on EI**
   We're going to start broadly by talking about your overall experiences in early intervention (which I'll sometimes refer to as EI) and with working with your practitioner. I'll be asking questions throughout the interview, but please let me know if any of them are unclear so I can provide more explanation.
   a. Think back to when you first started seeing [practitioner]. Tell me about what you expected from your visits and from EI in general.
      i. How have your expectations changed? What are you hoping you and your family will get out of it?
      ii. Tell me how your practitioner talked to you about their role during sessions and your role.
          a. If N/A, would you like to have a conversation about that?
   b. Walk me through a typical teleintervention visit with your practitioner.

2. **Reflection on experience with the intervention condition**
   Thank you. Now I'm going to ask you some questions that are more specific to the project and your sessions with your practitioner over the last six months.
   a. Reflect on your sessions with [practitioner] since [training date]. Tell me about the changes you've noticed in your practitioner's coaching style since that time.
      i. Probe: how do they interact with you differently during sessions?
          a. What changes have you noticed in how they support your interactions with your child?

ii. What does that look like?
iii. [If they focus on the shift to teleintervention, ask them what other changes they've noticed.]

b. Think about what happens during sessions that really helps you and your child the most. Tell me what your practitioner does that really supports you with your child's development (talking, planning, supporting you and child in the moment)?
   i. Or: what feels like the best use of your time during sessions? When do you have that feeling that a session was just what you needed or it went really well?
   1. Describe an example of when this happened.
   ii. Do you generally prefer when your practitioner works with you, with your child, or with the two of you together?

c. Tell me about the progress you and your child have made toward your outcomes over the last couple of months.
   i. Describe what has helped the most with supporting your progress.
   ii. How could your practitioner help you even more with meeting your goals/outcomes as a family?

d. How has your relationship with [practitioner] changed over the last few months?
   iii. [If they focus on the shift to teleintervention, ask them what other changes they've noticed.]

3. Reflection on triadic strategies

For this study, we provided training and coaching for practitioners in a set of parent coaching strategies. These strategies use adult learning principles to help guide parents and their children through activities and interactions that they can use between session. Now I'm going to briefly describe the coaching strategies to you so you can tell me what your thoughts about them.

a. [Share screen with descriptions of each strategy and briefly review each one. Describe ED, AP, FA, PD, MO, SU]
   I. Which of these sound like they'd be most helpful for you during sessions?
   II. Can you describe a time when <u>practitioner</u> used those strategies?

4. Reflection on data

Throughout this project, we've been collecting data, starting with the questionnaire you completed back in January. We've also been watching the videos your practitioner recorded and counting a couple of things. For one, we've been counting how often they use the parent coaching strategies we just talked about. We've also been keeping track of how often you and your child interact with each other (smile at each other, play together, talk to each other, etc.). I'm going to show you some of the data and I'm curious to hear your thoughts about it.

a. First let's talk about the questionnaire. (Look at survey #14)

I. You indicated: _____ (e.g., “The service provider involves me in a way where I can continue to do the interventions without the provider’s ongoing assistance.”) Walk me through how they do this.

b. Now we’re going to look at a data graph. (Show them the graph, explain how it works, and ask for questions.) When we look at this graph, we’re looking at changes in 1) how often your practitioner used these parent coaching strategies and 2) how much time you and your child were interacting with each other.
   I. What are your thoughts on the patterns here when you first see this?
   II. Remark on it, e.g., “I noticed some big changes in your interactions with your practitioner between x and y, what influenced this?”
   III. Did you notice these changes before looking at the data or is this surprising? What other changes have you noticed that might not be reflected in the data?
      i. Some examples of when the practitioner was using these strategies is when they helped you and your child with [see list below]. If you did notice, how did these strategies feel supportive or limiting in your sessions?
      ii. How useful/helpful were those sessions for you and your child?

5. Closing

a. What would you like to tell me as someone who trains EI practitioners that I haven’t asked you about? What would you like them to know?
b. Thank you for your time. I am going to email you a gift card to thank you for participating in this interview. Would you like me to use the email we used for scheduling?

Appendix G

Triadic Strategies in EI Teleintervention

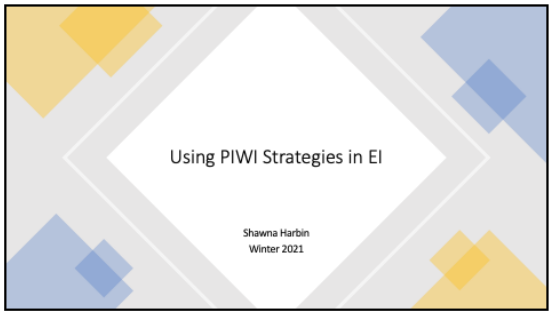
Intervention Manual

2021

Triadic Strategies Training Protocol

Triadic Strategies Training Protocol			
	Yes	No	Notes
Materials prepped before meeting			
Slide deck, Triadic strategies definition sheet, Goal planning form			
1. Introduction to the triadic strategies.			
Briefly describe background of FCP and triadic strategies			
Connection to recommended practices.			
2. Define and describe triadic strategies			
Describe Establish Dyadic context			
Provide 1 example minimum			
Describe Affirm Parent Competence			
Provide 1 example minimum			
Describe Focus Attention			
Provide 1 example minimum			
Describe Provide Developmental Information			
Provide 1 example minimum			
Describe Model			
Provide 1 example minimum			
Describe Suggest			
Provide 1 example minimum			
3. Review application of strategies			
Review guidelines for using triadic strategies			
General Q&A			
4. Goal planning			
Review how to complete the goal planning form			
Provide time for practitioner to complete the goal planning form			
Ask practitioner to email me goal planning form and/or bring it to their first coaching session.			
5. Closing			
Schedule first coaching session(s)			

Sample Slides from Triadic Strategies Training



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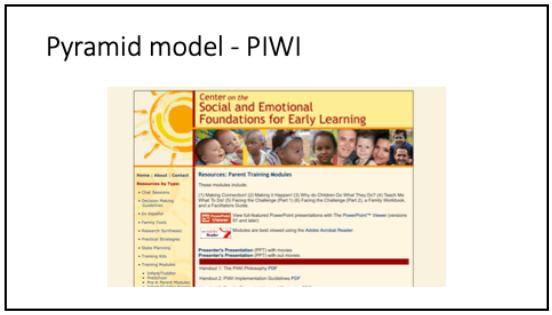

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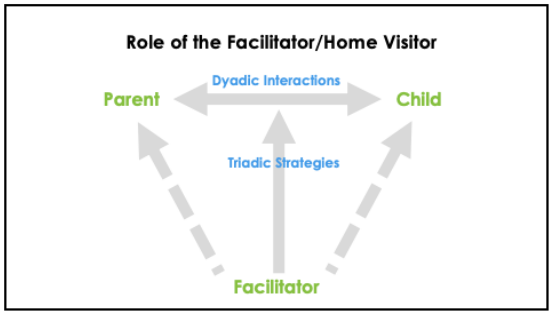

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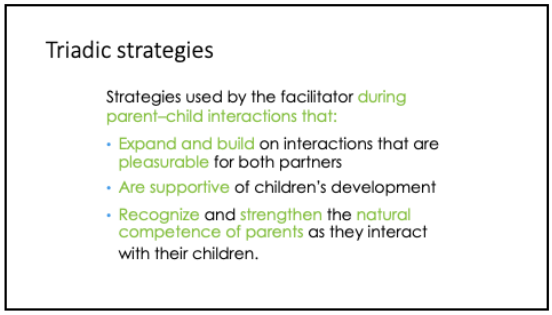

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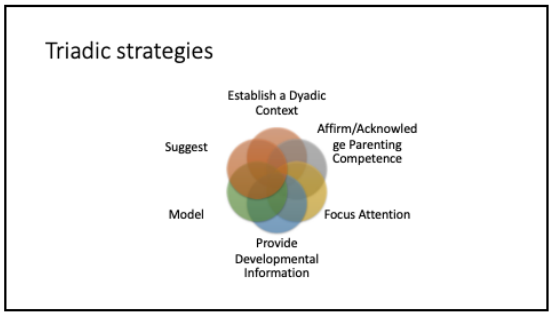

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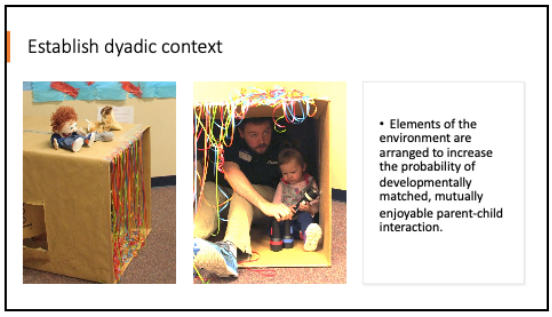

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8

Affirm/Acknowledge Parenting Competence....

- Developmentally supportive interactions are warmly recognized and expanded upon, as are characteristics of child competence

9

A parent's voice

"They (the providers) would compliment what I was doing. It made me feel like I was doing something really well."

10

Focus attention

- Aspects of the interaction are commented upon, expanded, or questioned in order to draw the parent's attention to particular competencies or actions in themselves or the child

11

11

Provide developmental information

- Information about the child's developmental agenda is given by verbally labeling or interpreting the child's emotional, cognitive, language, and motor abilities within the context of play and interaction

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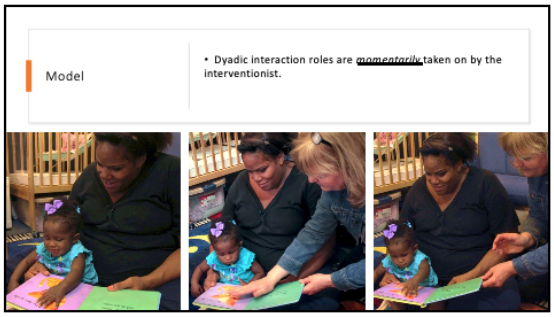

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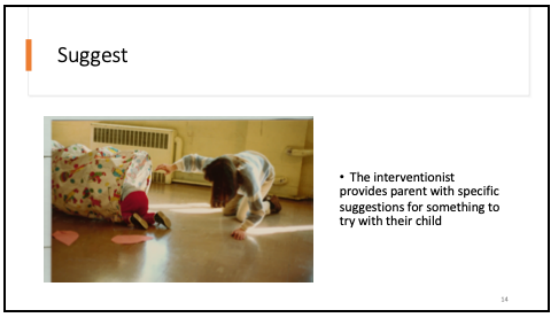

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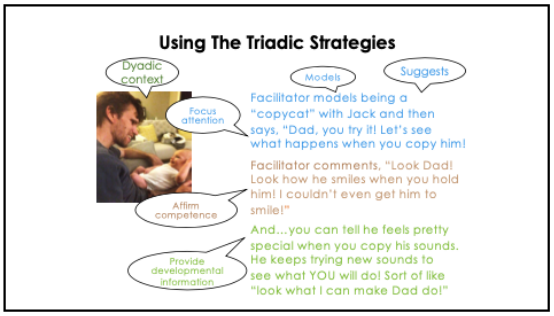

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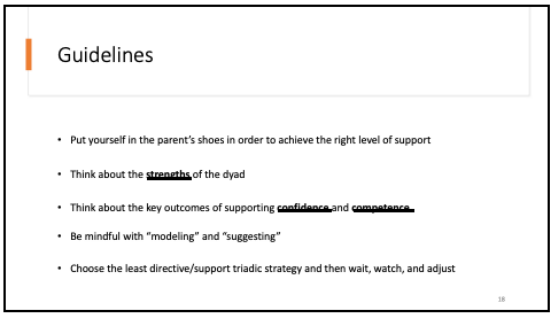

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Coaching Protocol

Materials to prepare:

- Action planning form
- Triadic strategies definition sheet
- Prepared video clip of practitioner teleintervention session with notes about featured strategies.

Opening of meeting (2-3 mins)

1. Let the practitioner know that you are going to begin recording the meeting.
2. Open the meeting with a positive social greeting.

Introduction to coaching process (session #1 only) (3-5 mins)

3. As an introduction to coaching, describe the following goals of the coaching process:
    a. To support the practitioner with understanding and implementing the triadic strategies during teleintervention sessions.
    b. To use video clips from practitioner's teleintervention sessions to identify strategies the practitioner is already using and additional strategies the practitioner can use. Let them know that using clips:
        i. Shows us examples of when and how the practitioner is using these strategies effectively,
        ii. Allows us to think of other opportunities for incorporating strategies, and
        iii. Allows the practitioner to observe their own practices and self-reflect.
    c. To engage in reflection, monitor progress, and provide support around use of all strategies.
    d. To brainstorm solutions to challenges with implementation.
4. Remind the practitioner that they are welcome to reach out with any questions via email as needed.
5. Explain the process of coaching and inform the practitioner there will be:
    a. Continued weekly recorded teleintervention session (involving their participating triad family), which they will submit to the research team within one day of the teleintervention session.
    b. One weekly virtual coaching meeting scheduled at a convenient time and conducted via Zoom.
    c. One weekly follow-up email from their coach, to be sent within one day of the coaching meeting.
6. Q&A: Ask the practitioner what questions they have regarding the coaching goals and process and answer them.

Review of triadic strategies (5 mins)

7. Review triadic strategies and definitions, as needed.
8. Q&A: answer practitioner questions about strategy definitions and implementation

Observation and reflection (10 mins)

9. Debrief previous week's teleintervention session. What worked well? What was challenging?
10. Review action plan items from previous week (weeks 2-5).
11. Observation of recorded clip(s) from the practitioner's most recently submitted weekly teleintervention session.
    a. Signal for them that we'll watch it one time together and take notes, then we'll watch it in chunks so we can talk.
12. Provide time for practitioner to take notes and engage in self-reflection around observed practices.
    a. Encourage practitioner to reference the list of triadic strategies definitions.
13. Take turns sharing observations from the video clips.
    a. Practitioner will share self-reflections.
    b. Coach will share feedback, identifying at least one strategy that was implemented well and one suggestion for how to implement strategies.

Action planning (5 mins)

14. Provide time for practitioner to create action plan for implementing triadic strategies during their next session with target family.
15. Ask the practitioner to share the goals they developed and record practitioner goal.

Planning (3 mins)

16. Schedule a specific time with the practitioner for the next coaching meeting to take place the following week.
17. Remind the practitioner that they will be receiving a follow up email with a summary of content from this coaching meeting.

After the meeting

18. Send an email to the practitioner that briefly summarizes the meeting and attach any relevant forms to support the practitioner.

Coaching Fidelity Checklist

Video ID:_____ Reviewer name: _____ Date of review: _____

Coaching Component Checklist	Y	N	NA	Notes
Opening the Meeting				
1.1. Open the meeting with a positive social greeting (this may have occurred before recording began)				
1.2. Ask the teacher to tell me about their home visit family (session #1 only)				
Introduction to the coaching process (session #1 only)				
1.3. Describe the goals of the coaching process: ● To support the teacher with understanding and implementing the triadic strategies during teleintervention sessions. ● To use video clips from teacher's teleintervention sessions to identify strategies the teacher is already using and additional strategies the teacher can use. ● To engage in reflection, monitor progress, and provide support around use of all strategies. ● To brainstorm solutions to problems with implementation.				
1.4. Explain the process of coaching and remind the teacher there will be 1 weekly recorded teleintervention session and 1 weekly virtual coaching meeting at a convenient time.				
1.5. Invite Q&A about coaching				
Review of strategies (for session #1 only)				
1.7 Refer to training content and review triadic strategies and their definitions.				
1.8. Invite Q&A about strategy definitions and implementation.				
Observation and reflection				
1.9. Debrief teleintervention session.				
1.10. Refer to goals on previous action plan (not session #1)				
1.11. Observation of recorded clips from the practitioner's weekly teleintervention session.				
1.12. Invite practitioner self-reflection of clips (may use triadic strategies table to guide reflection).				
1.13. Coach shares feedback, identifying at least one strategy/practice that was implemented and providing one suggestion/wondering/expansion for implementing strategies/practices in the future (this may occur during action planning).				

Action planning				
1.14. Provide time for teacher to create action plan for next coaching meeting (mark N/A if teacher prefers to complete it on their own time).				
1.15. Ask the teacher to share their goals or send the action plan via email.				
Scheduling				
1.16 Plan/confirm a specific time with the teacher for the next meeting (mark N/A if already planned, teacher delays, or if this is the final coach meeting).				