2022

Outdoor Early Intervention Services: Current Practices and Future Directions

Tiffany Lee
University of Denver

Outdoor Early Intervention Services: Current Practices and Future Directions

Abstract

Outdoor play is a crucial in supporting child development, resiliency, social skills, creative thinking, adaptability, family growth, and family engagement. Unfortunately, children are spending less time outside because of technology, parent fears, and other factors. Parents who have a child with a disability have even more challenges when it comes to playing outside. Thus, children with disabilities are spending even less time in outdoor environments. Early Intervention (EI) is a program that is designed for infants and toddlers between the ages of zero to three that have developmental delays and/or disabilities. EI uses a family-center approach in natural environments to enhance parent capabilities by supporting their child in everyday environments that all children have access too. Unfortunately, many EI providers report using a medical model for various reasons and there is little evidence that suggests families and EI providers are going outside for sessions. EI has the potential to support families in outdoor environments so parents and children can enjoy the vast benefits outdoor play and exploration has to offer.

The purpose of this study was to explore the current practices, perceived benefits, and perceived barriers parents have with Outdoor EI services. An extensive review of literature analyzed the needs of EI and how outdoor supports can address those needs. Based on the literature review, survey items were collected and formatted. To help establish validity, expert reviews and cognitive interviews took place. After all revisions were completed and approved, the Outdoor Early Intervention Survey (OEIS) was sent out to families in EI services. The OEIS was completed by 152 caregivers that have a child enrolled in EI services in the state of Colorado. Descriptive statistics, reliability analysis, and t-tests were performed on the scale data. The scale was found to be reliable for the benefits scale (Cronbach's a: .87) and the barriers scale (Cronbach's a: .76). Families showed a desire to go outside with their EI provider (M=3.0) and disagreed that there were many barriers to Outdoor EI (M= 1.4). Study findings, limitations, and recommendations for future research are discussed.

Document Type

Dissertation

Degree Name

Ph.D.

Department

Child, Family and School Psychology

First Advisor

Gloria Miller

Second Advisor

Jeanine Coleman

Third Advisor

Kevin Morris

Keywords

Early childhood education, Outdoor play

Outdoor Early Intervention Services: Current Practices and Future Directions

_____

A Dissertation

Presented to

the Faculty of the Morgridge College of Education

University of Denver

_____

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

_____

by

Tiffany Lee

August 2022

Advisor: Gloria Miller, PhD

Author: Tiffany Lee
Title: Outdoor Early Intervention Services: Current Practices and Future Direction
Advisor: Gloria Miller, PhD
Degree Date: August 2022

Abstract

Outdoor play is a crucial in supporting child development, resiliency, social skills, creative thinking, adaptability, family growth, and family engagement. Unfortunately, children are spending less time outside because of technology, parent fears, and other factors. Parents who have a child with a disability have even more challenges when it comes to playing outside. Thus, children with disabilities are spending even less time in outdoor environments. Early Intervention (EI) is a program that is designed for infants and toddlers between the ages of zero to three that have developmental delays and/or disabilities. EI uses a family-center approach in natural environments to enhance parent capabilities by supporting their child in everyday environments that all children have access too. Unfortunately, many EI providers report using a medical model for various reasons and there is little evidence that suggests families and EI providers are going outside for sessions. EI has the potential to support families in outdoor environments so parents and children can enjoy the vast benefits outdoor play and exploration has to offer.

The purpose of this study was to explore the current practices, perceived benefits, and perceived barriers parents have with Outdoor EI services. An extensive review of literature analyzed the needs of EI and how outdoor supports can address those needs. Based on the literature review, survey items were collected and formatted. To help establish validity, expert reviews and cognitive interviews took place. After all revisions were completed and approved, the Outdoor Early Intervention Survey (OEIS) was sent

out to families in EI services. The OEIS was completed by 152 caregivers that have a child enrolled in EI services in the state of Colorado. Descriptive statistics, reliability analysis, and *t*-tests were performed on the scale data. The scale was found to be reliable for the benefits scale (Cronbach's a: .87) and the barriers scale (Cronbach's a: .76). Families showed a desire to go outside with their EI provider (M=3.0) and disagreed that there were many barriers to Outdoor EI (M= 1.4). Study findings, limitations, and recommendations for future research are discussed.

Table of Contents

List Of Tables

List Of Figures

Chapter 1: Introduction and Literature Review

Outdoor play gives children an opportunity to experience the world through the use of their senses. These sensory experiences initiate a creative learning environment for children. However, for young children with disabilities and development delays, outdoor play can be difficult to access, preventing them from engaging in the same environments as their peers. Early Intervention (EI), a program designed for infants and toddlers with developmental delays and disabilities, may be a source that can support parents and their young children in these environments.

Nature allows a child to independently explore the world. Researchers argue that adults see the world through a "larger scale," while children see the "niches" within their immediate environment (Nabhan & Trimble, 1994; Parsons, 2011). By allowing children to explore their outdoor environment, adults are giving children the freedom to discover and make sense of their surroundings. However, with today's shifting views of technology, children are spending less time outside (Clements, 2004). Unfortunately, technology cannot provide the same lifelong experiences as the outdoors; therefore, children are missing these valuable opportunities. Richard Louv author of *Last Child in the Woods (*2008) argues that the declining interaction between children and nature is

having negative effects on children's wellbeing. Louv dubbed the term "Nature-Deficit Disorder (p. 36)."

Infants and toddlers also learn by interacting with the world around them. They have a natural curiosity to explore their surroundings. Adults become use to these simple pleasures and forget about their presence. However, when on a walk with a toddler, adults are reminded of the airplane in the sky, the butterfly flying by, or the leaves on the ground.

For infants and toddlers with disabilities, it is imperative to give them similar outdoor experiences as their same age peers. However, many factors limit these opportunities, including physical limitations, behavioral concerns, parent overprotection, and social factors (Shields & Synnot, 2016; CDC, 2019). For families with children with disabilities who are receiving EI, providers, such as special educators, social workers, or speech language pathologists may be in the best position to support families in accessing and engaging in the outdoors with their child as part of their intervention services. Not only will this enable infants and toddlers with a disability to receive the same sensory and learning experiences as their peers, it will also provide more opportunities to be included with same-aged peers without a disability.

Outdoor EI aligns with the formal policy and procedures required in EI in that it allows young children and their families to have access to everyday community settings. Unfortunately, Outdoor EI service provision is a relatively unexplored area. EI mandates that services take place in the "natural" environments, which is described as settings that

are typical to a young child's routine (formal definition provided below). However, this term typically has been represented as occurring within the child's home setting (Hebbeler et al., 2017). Over 80% of infants and toddlers receive early intervention in their home (OSEP, 2010). Although interventions taking place in the home are crucial, many barriers also have been cited, such as limited generalizability of skills, reduced inclusion of same aged peers, disconnection between the EI provider and the family, and a restricted view of the EI provider as a professional that "fixes" a child (Baril, 2018). Additionally, parents often become distracted by daily household chores during home visits limiting their participation in ongoing service delivery. Outdoor EI can help combat these issues by using a family-centered (FC) model to coach parents in essential skills with their child that focus parent-child interactions and explorations in outdoor surroundings.

Currently there is limited literature on factors that might promote or hinder EI in outdoor settings. More information from the perspective of parents is needed to find new ways for outdoor contexts to become more subsumed into EI service planning and delivery. Moving forward, the term Outdoor EI will be used to describe EI services taking place in outdoor settings (formal definition provided below).

Statement of the Problem

Over the last decade, children and their families have been spending less time outside (Clements, 2004). Many factors have been cited as contributing to this decrease such as screen time, parental fears of abduction, and a shift towards urbanization leading

to less green spaces (Louv, 2008). For young children with disabilities, spending time outdoors and engaging in outdoor play is even harder to access for a number of reasons. First, from a parent's perspective, outdoor spaces may not provide a safe or comfortable place for promoting play or for meeting their child's special needs (Von Benzon, 2011). This contributes to hesitancy in spending time in these settings. However, limiting outdoor play hinders children from different learning and sensory experiences (Parsons, 2011). Furthermore, by reducing access to outdoor environments, children with disabilities are spending less time with their same-aged peers without disabilities. Additionally, parents are also reducing their time in outdoor environments; therefore, decreasing their ability to build social support. A lack of social support has been shown to contribute to increased feelings of isolation, increased depressions, and mental fatigue (National Counsel on Disability, 2010). EI is an easily accessible option that can promote rich learning opportunities in everyday settings that all children and parents have access to.

Outdoor EI is being intentional in the definition of natural environments to literally mean "nature." EI providers can give guidance to integrate intervention strategies in outdoor environments. Through this approach, EI providers assist families in developing the knowledge and skills to provide outdoor play for their child who has a developmental delay or disability. Currently, there are barriers with FC practices. Many providers find it difficult to implement for a number of reasons. Outdoor EI may be a way to help establish FC practices, enhance child development, and assist with parent well-being. However, more research is required in Outdoor EI for supporting providers

and parents with evidence-based intervention. Before an intervention can be created, information needs to be collected regarding parents' perceptions of Outdoor EI and the benefits and barriers for this type of intervention. Once this information is known, researchers can create an intervention specific to the need of EI. The intent of this dissertation is to collect the preliminary data needed for future interventions.

Research Questions

A survey for families with an infant or toddler with disabilities was created to assess current EI practices taking place in the outdoors and impressions of benefits and barriers to implementation of Outdoor EI in one western state. The major questions addressed were the following. Two additional sub questions were addressed based on sufficient response rate. The first is designed to consider the context of families' location. In Colorado, almost 80% of school districts are considered rural (Colorado Department of Education, 2018), it would be important to investigate if differences in answers to the major research questions are found based on if a family lives and receives services in a district considered rural versus urban and suburban. The second is to consider if differences in parental responses might be due to the different type of services that a child receive. For example, families who have a child with a physical disability report challenges navigating playground equipment (Parkes, McCullough, & Madden, 2010). Whereas, parents with a child that has Autism Spectrum Disorder report challenges with sensory stimulation (Edimiston, Merkle, & Corbett, 2015). It would be important to investigate if differences in answers to the major research questions are found based on the type of services a child receives. An additional sub analysis was conducted to assess

if the type of disability services and location impacts the perceived desirability and barriers of parents. This is important because data will be able to help future researchers create an evidence-based intervention specific to the needs of families in EI.

1) What is the current state of Outdoor EI?
2) What are the perceptions of desirability regarding Outdoor EI?
    a. What are the perceptions of desirability between rural, urban, and suburban areas?
    b. What are the perceptions of desirability between services?
3) What are the perceptions of barriers regarding Outdoor EI?
    a. What are the perceptions of barriers between rural, urban, and suburban areas?

Operational Definitions

The key terms included in this and subsequent chapters are clarified below.

Early intervention (EI): Early intervention is a mandated service through Part C of the Individuals with Disabilities Education Improvement Act (IDEIA) for children from birth to age three who are eligible based on delay, disability, or risk factors (IDEIA, 2004). Even though the title has been changed, IDEIA is typically referred to as IDEA. To keep consistency with other literature the abbreviation that will be used in this dissertation will be IDEA.

Natural environments: IDEIA requires EI services to take place in the "natural environment," which is defined as "settings that are natural or typical for a same-aged infant or toddler without a disability, may include the home or community settings (§303.26)." Raver (2014) described natural environments as "settings that are important to a specific child and family, as well as places and activities that the child and family would engage in if the child did not have a delay or disability (p. 9)."

Provider: IDEA defines qualified provider personnel as "personnel who have met state approved or recognized certification, licensing, registration, or other comparable requirements that apply to the areas in which individuals are conducting evaluations or assessments or providing early intervention services (§303.31)." Qualified early intervention personnel who provide services may include special educators, speech-language pathologists, occupational therapists, physical therapist, psychologists, social workers, nurses, vision specialists, registered dietitians, and more.

Infant or Toddler with a Disability: Section 303.21 under IDEA defines an infant or toddler with a disability as an individual under three years of age who needs early intervention services because the individual (a) is experiencing a developmental delay in one or more of the following developmental areas: adaptive, communication, cognitive, social or emotional, physical, including vision or hearing. (b) Has a diagnosed physical or mental condition that has a high probability resulting in a developmental delay. At states discretion, infants and toddlers may qualify for services if they are determined at-risk, which is defined as an infant or toddler who is at risk of a developmental delay due to

biological or environmental factors (i.e. birth weight, lack of oxygen, nutritional deprivation, history of abuse or neglect, or withdrawal symptoms resulting from prenatal drug exposure (§303.5).

Family: The individuals that create the most inner circle for an infant or toddler. This may include parents, guardians, grandparents, siblings, aunts, uncles, and anyone else the family identifies as a family member.

Parent: A person who provides primary care for the child. This may include biological parents, foster parents, guardians, adoptive parents, aunts, uncles, and/or grandparents.

Family-Centered Approach: The primary objective of this approach is to enhance children's development by promoting caregiver's knowledge, skills, and efficacy regarding the application of critical early intervention strategies with their child that can be embedded during everyday learning opportunities in natural environments (DEC, 2015). This approach also is founded upon strengths-based and culturally responsive principles. Family-center practices have an emphasis on parent coaching, joint planning, observation, practice, feedback, and reflection practices (Baril, 2018).

Family-Professional Partnership (FPP*):* Keilty (2010) explained these partnerships as one that "blends the professional's general knowledge and experiences with the family's specific knowledge and experiences to create and implement an

intervention plan tailored to the unique family and child (p.2).” FPP is the heart of the family-centered approach and a guiding philosophy of EI.

Outdoor EI: Revell, Duncan, & Cooper (2014) argue that there are a host of interchangeable labels that describe therapy taking place in the outdoor settings. Such terms have included adventure therapy, wilderness therapy, outdoor education, nature therapy, and Bush Adventure Therapy. Revell, Duncan, & Cooper (2014) suggest the term ‘outdoor therapy’ has shown to be more favorable amongst researchers because the term ‘outdoor’ is most consistently used internationally. Secondly, the term ‘outdoor’ encompasses all settings in which outdoor experiences can occur (i.e. wilderness and urban). However, since not all EI providers are ‘therapists,’ outdoor therapy is not an appropriate fit.

Outdoor EI will be used to capture the broad range of intervention services that take place. Furthermore, Outdoor EI describes services that take place in open air away from confined buildings or space where there are many natural elements such as plants, animals, and other features of the earth in which young children and their families can use different senses to experience their surroundings. Potential Outdoor EI sites might include parks, family yards, reservoirs, and nature trails. In a more urban context, Outdoor EI might include community gardens, green spaces, zoos, swimming pools. and botanical gardens.

Nature-Based Interventions: As mentioned in Outdoor EI, the term outdoor supports can take on different meanings. The term nature-based intervention is a general

term that explains supports that take place in outdoor settings. This may include education, mental health, and social supports.

Urban and rural settings. The US Census Bureau (2010) defines urban areas as: an urban area will comprise a densely settled core of census tracts and/or census blocks that meet minimum population density requirements, along with adjacent territory containing non-residential urban land uses as well as territory with low population density included to link outlying densely settled territory with the densely settled core. To qualify as an urban area, the territory identified according to criteria must encompass at least 2,500 people, at least 1,500 of which reside outside institutional group quarters. The US Census Bureau (2010) identifies two types of urban areas:

1. Urbanized Areas (UAs) of 50,000 or more people;
2. Urban Clusters (UCs) of at least 2,500 and less than 50,000 people.

"Rural" encompasses all population, housing, and territory not included within an urban area (p.1).

Frontier. The Colorado Rural Health Center (2016) defines frontier counties with a "population density of 6 or fewer persons per square mile" (p.1).

Chapter 2: Review of Literature

The literature review for this dissertation was organized into four sections. In the first section, legislation and program requirements for EI are described. In the second section, EI services delivery requirements are described. Current barriers that take place within EI service delivery requirements are described in the third section. Finally, literature will be reviewed on nature-based programs and potential outcomes Outdoor EI may have with families and children.

What is Early Intervention?

EI services are designed to enhance the developmental needs of infants and toddlers with disabilities. The program is designed for children ages birth to their third birthday and their families. Requirements for the provision of EI services is part of a federal law required by all states.

Congressed passed Public Law 94-142 in 1975, which was called the Education of All Handicapped Children Act (EHCA). At this point in time, the law specifically focused on all school-aged children receiving free appropriate public education. Infants and toddlers were not implemented into legislation until the reauthorization of the law, P.L. 99-457, in 1986. This is when Part H, Infants and Toddler's Disability Act was

created. Congress created the program in recognition of an "urgent and substantial" need to:

> (1) to enhance the development of handicapped infants and toddlers and to minimize their potential for developmental delay,
> (2) to reduce the educational costs to our society, including our Nation's schools, by minimizing the need for special education and related services after handicapped infants and toddlers reach school age,
> (3) to minimize the likelihood of institutionalization of handicapped individuals and maximize the potential for their independent living in society, and
> (4) to enhance the capacity of families to meet the special needs of their infants and toddlers with handicaps (Public-Law 99-457, 1989, p. 1)

EI has been reauthorized and amended multiple times since the creation of the program. There have been many changes that have occurred, for example the term "handicapped" is no longer used; therefore, the name of the law changed from EHCA to Individuals with Disabilities Education Improvement Act (IDEIA). Additionally, EI is no longer listed as a Part H service, it is now listed as a Part C service under IDEIA. The most recent changes to EI occurred in 2011.

Eligibility

Eligibility requirements for EI vary from state to state. At a minimum, each state must create a thorough definition of the term "developmental delay" and identify how it will be measured. Federal guidelines for eligibility require states to use appropriate diagnostic instruments and procedures to determine if the child is delayed in at least one of the following: communication, physical (including vision and hearing), cognitive, social and emotional development, or adaptive (§300.111). Additionally, states can

choose if they will serve “at-risk” infants and toddlers. This term refers to infants and toddlers who are at-risk of having a developmental delay because of conditions such as low birth weight, lack of oxygen, infection, drug exposure, or a history of abuse or neglect ((§303.5).

Getting Started

Once a child is eligible, the family, Service coordinators (SC), and an EI provider create an Individualized Family Services Plan (IFSP). The IFSP is a crucial document that provides details on the child’s current levels of functioning, family routines, family goals (referred to as outcomes), and a list of EI services the family will receive. There is a host of services that a family can receive in EI. The most common types of services include speech therapy, developmental intervention, occupational therapy, and physical therapy. Some other types of services include vision, audiology, and nutrition. The type of service that is selected is based on the needs of the family and not necessarily the eligibility status of the child. For example, a child may qualify for a communication delay, but the family has concerns that go beyond communication. Thus, a developmental interventionist may be the best fit for the family. The IFSP takes a family-based approach which means it is developed with input from the child’s entire family and includes supports that benefit the entire family. After the IFSP is completed, an EI provider can begin ongoing services with the family.

Service Coordination

A service coordinator (SC) initially is assigned to a family as soon as the family is scheduled for an evaluation to help guide them through the EI process. If a child is determined eligible, an ongoing service coordinator is assigned. This person assists the family by coordinating services, providing resources, and ensuring the family's rights are protected. The SC is responsible for assigning the family with required ongoing EI providers. The SC is the person that will stay with the family the entire length the family is in the program. They meet with the family every six months to review the child's services and goals. In addition, SCs have monthly contact with families to check in about services and family resources.

EI Service Delivery Requirements

In this section, service delivery requirements from IDEIA will be described. Not all requirements are listed in this chapter. The requirements discussed are areas where Outdoor EI may be a source of support.

Bronfenbrenner's Ecological Model

Rooted in Early Intervention's service deliver model is Bronfenbrenner's ecological model (1979). This model consists of different systems that can impact a child's growth and development while also possessing a great deal of influence that supports family-center approaches.

Bronfenbrenner's (1979) ecological model consists of four different systems that can impact a child's growth and development, which include the microsystem,

mesosystem, exosystem, and macrosystem. The microsystem is the innermost part of the circle and has the most immediate impact on a child. This typically includes the child's home and school and the people that are within these settings (i.e. providers, teachers, parents, siblings, peers). The mesosystem is the relationship between the microsystem and the quality of the interactions. This system has the most direct impact on family and outside connections such as school and home-based programs (Lines, Miller, & Arthur-Stanley, 2011). The exosystem are the contexts that have an indirect influence on a child because they directly impact individuals within the mesosystem and microsystem (i.e. family member working long hours and cannot attend EI sessions). The macrosystem also has an indirect influence on a child and is the broadest of the systems. This level consists of higher systems such as, laws, religion, economics, and policy.

Family-Centered Approach

During the first few years of a life, a child's brain is growing and developing all major developmental areas (Owens, 2008). When developmental concerns arise, it is crucial to intervene at a young age while neurons are forming connections in the child's brain (Batshaw, 2002). A child's brain has much plasticity that can be sculpted by their family through nurturing, supporting, and stimulating environments (Batshaw, 2002). A foundational parenting skill needed to support brain development includes parent child interactions. Research has shown that parents who attune to their child and have quality interactions multiple times a day lead to better child outcomes (Cohen, 2017). The core of

family-center models focuses on enhancing the interactions between a parent and child to address the needs of the family.

A minimum requirement for all states is that families must be involved in all components of EI. To support this obligation, EI uses a theoretical framework that implements Family-Centered (FC) practices. According to Bruder (2000), FC emphasizes developing an EI provider-caregiver partnership, building parent capacity, and encouraging family decision-making. Due to the structure of EI, children and their families typically receive therapy one time per week. This time is allotted to parent coaching so that parents can practice child-focused techniques and interventions independently. Using an FC approach towards EI allows families to strengthen their abilities to support their child with learning experiences and opportunities throughout their daily routines and within different environments (Peterson, Luze, Eshbaugh, Jeon, & Kantz, 2007). When FC approaches are implemented correctly, parents learn to generalize EI techniques in everyday occurrences; therefore, optimizing their child's learning opportunities in multiple settings.

Family-center models provide effective interventions to parents that support the development of their child. In a randomized control trial involving 98 children and families, a parent-delivered intervention for toddlers with Autism Spectrum Disorder (ASD) ages 14 to 24 months showed that parent-driven intervention created stronger work alliances between parents and EI providers and the children had positive growth in their development (Rogers, et al., 2012). Participants who had a better work alliance with

their EI provider were more likely to practice the interventions independently. Rogers, et al. (2012), discussed that the relationship between parents and EI providers is crucial when it comes to learning intervention techniques specific to the child. Strong relationships allow EI providers to understand the needs of the family and to design and implement more successful family-focused interventions. Families are more likely to have buy-in with interventions when they feel that they are important and fit within their routines. A strong connection and understanding between the EI provider and the family is needed to work collaboratively. Without this, parents and EI provider may face challenges when working together. The relationship between family members and EI providers is known as a family-professional partnership (FPP).

Family Professional Partnerships

In order for parents and EI providers to carry out FC practices, an FPP must be established. Keilty (2010) describes the FPP relationship in two parts. First, the relationship must develop a *what*. The *what* is specific to family-driven outcomes. These are a shared understanding of goals the family would like to work on during early intervention visits and throughout their family routines. The second part of the relationship is the *how*. The *how* describes the way the family and provider will partner together to meet those goals.

Keilty (2010) suggests that EI providers interact with the family in a casual and friendly manner and view the family as an ally who has critical child-focused information and other resources. Dunst &Trivette (2009) further propose that an FPP must meet the

priorities of the family. The EI provider must appreciate the family's priorities and choices, relate to the family's feelings, ask for and really listen to what the family is saying, and truly believe in the family's abilities. Finally, to develop strong FPPs, six key components were founded by the Minnesota Technical Assistance for Family Support (2004): (1) active support of each other, (2) shared power and equal participation, (3) common objectives, (4) clear scope and boundaries, (5) agreement and openness, and (6) mutual benefits and trust.

In the Family-Provider Relationship Quality (FPRQ) project a measure was developed to assess the quality of family-provider relationships (FPR) (Forry et al., 2012). Through their extensive literature review they were able to identify many factors that influenced FPR and the direct outcomes from the relationship. They proposed a model with three major components: factors that may influence FPR, effective provider facilitation of FPR, and outcomes-impacts. Factors that may influence FPR consist of characteristics from the family, provider, and the community that influence the relationship between providers and families. These characteristics included: demographic; personal and professional; health and mental health; attitudes, values, and expectations; parental employment; organization expectations; stressors; resources; features of the community; community norms, dynamics, and social networks. The second section, effective provider facilitation of FPR, consist of four constructs that influenced successful facilitation of home visits. These constructs included attitudes, knowledge, practices, and environmental features. Finally, in the third section, outcomes-impacts, referred to how strong relationship and facilitation factors led to positive

outcomes in the provider, family, and child. Based on the model, there were positive outcomes in higher levels of parent engagement, family empowerment, improved parent-child interactions, family well-being, and child development. When providers, families, and community are well matched in characteristics then providers facilitated home visits that were more family-centered.

Natural Environments

The setting where services take place is a key component of the family-centered model used in EI. IDEIA (2004) encourages that services for infants and toddlers take place in environments where typically developing children have access too, which they call "natural environments" (§303.26). The Division for Early Childhood (DEC) defines natural environments as

> Settings in which children without disabilities spend time. Common places include the home, childcare programs, family daycare homes, and community settings (e.g. stores, barber shops, doctor offices, parks, etc.) and programs (e.g. children's hour at the library, gymnastics classes, etc.) available to all children in society. Activities and routines may need to be adapted to ensure that children with disabilities are able to participate and be integral members (DEC, 2015, p.11).

The law mandates children in EI to have access to everyday environments with peers their age because it promotes inclusion. DEC (2009) defines inclusion as

> Early childhood inclusion embodies the values, policies, and practices that support the right of every infant and young child and his or her family, regardless of ability, to participate in a broad range of activities and contexts as full members of families, communities, and society. The desired results of inclusive experiences for children with and without disabilities and their families include a sense of

> belonging and membership, positive social relationships and friendships, and development and learning to reach their full potential (p.1).

Based on the results from numerous research articles, researchers have concluded that high-quality inclusive environments are beneficial for children with and without disabilities (Camilli et al., 2010; Guralnick, 2001; Strain & Bovey, 2011). From this work, DEC recommendations have been developed to use "blended instructional approaches" for children with disabilities that incorporate the "intentional teaching of developmentally appropriate practices" and "embeds individualized learning opportunities across the day" (DEC, 2015). This is why it is crucial that providers apply FC practices and strive for strong FPPs. Typically, providers only see a child once a week; therefore, providers need to coach parents on how to apply learning opportunities across their day and within different environments. This idea is further supported by authors of DEC Recommended Practices (2014) who stress that EI providers working with the family "modify and adapt the physical, social, and temporal environments to promote each child's access and participation in learning experiences" (p.9). It is important to include children with disabilities in the same environments as their typically developing peers. Children with disabilities have shown increased communication skills, better social skills, and increased play skills when they are able to interact with their peers (Camilli et al., 2010; Guralnick, 2001; Strain & Bovey, 2011). Children who do not have these opportunities are missing valuable chances to generalize their skills and to build meaningful relationships with their peers.

Barriers to EI Service-Delivery

In this next section barriers that exist within family-centered practices are discussed, including the structure of service delivery and other obstacles families in EI may face. "Barriers" are viewed as challenges that can be overcome versus as limitations or drawbacks that imply deficits that may not be easily addressed.

Medical Model

Numerous providers are still using a "medical" service-delivery model. This approach focuses on the services and *who* is delivery them (i.e., getting a physical therapist to address gross-motor) rather than learning through child-family interactions that take place at home and in the community. Unfortunately, providers who use this model, encourage parents to sit in the background and take a hands-off approach towards therapy. In a study conducted by Baril (2018), several providers reported that families are "*used to a medical model*" and are *"used to thinking of early intervention like a visit with a professional who 'fixes' their child."* Services implemented within a medical-service delivery model puts a provider in the expert and primary role which results in a "micro" view of the child. When looking through this lens, a provider does not see the whole child and how the child functions within their family and community settings.

There are many other challenges with the medical model of EI service delivery. First, this type of delivery hinders the skills of the child because it does not allow opportunities to practice new skills throughout the week with their parents. Second,

providers often miss important information within the family context that is impacting child development (e.g., parent mental health). Third, excluding parents from sessions denies them the opportunity to make informed decisions about their child.

Low Levels of Engagement

In order for FC practices to be effective, parents need to be engaged and actively participate during the session. Dunst et al., (2014) surveyed the different ways providers involved parents in their sessions. Their survey results showed that 1% of parents were not present, 24% of parents watched only, 21% of parents received provider explanation, 25% of parents received a demonstration from their provider, and 29% of parents received competence enhancement (CE) from the providers. CE is seen as the most effective way to conduct early intervention sessions, as this allows parents to learn the direct skill, perform the skill with feedback from the provider, and practice the skill independently throughout the week (Dunst et al., 2014). Additionally, parents can give the provider feedback if the manner in which the skill being taught is an effective strategy for the family to implement. Survey results imply that more than 71% of families are receiving intervention services that do not meet the definition of CE. As mentioned, this is a critical issue because CE is seen as the most effective way to conduct early intervention. For children who received services at a center-based location, this percentage of CE from the providers was smaller at 22%. Families who receive services outside the CE definition are denied the opportunities to take a hands-on approach

towards helping their child. Ultimately, neglecting the child of multiple learning opportunities throughout the week.

There can be many reasons why providers are not including parents in their sessions. In Baril's study (2018), EI providers reported challenges of parent implementation due to a lack of training in parent coaching, parents lacking confidence and competency in performing the skills, and family characteristics such as parent disposition, resources and language/culture. Additionally, EI providers reported that lower levels of engagement when families are trying to satisfy basic needs such as food and heat. This aligns with additional work that demonstrates parental relationship insecurity is related to lower levels of parent engagement (pieker et al., 2005; Heinickle et al., 2006). Additional factors that are related to lower levels of parent engagement include poverty, lower levels of education, young parents, family violence, or housing struggles (Korfmacher et al., 2008). Many of these factors are related to negative childhood outcomes such as developmental delays, neglect, abuse, malnourishment, and illness (Coley et al., 2013; Dubow et al, 2009).

Guralnick (2008) suggests that a major issue facing the field of early interventions is creating FPPs that respect diverse backgrounds and family perspectives. Other researchers have suggested the medical service-model does not always address the family needs, causing many families to not engage in therapy techniques because of feasibility, lack of knowledge, feelings of inadequacy, not aligning with the family's concerns, and misunderstanding of roles (Baril, 2018). It is vital that EI providers shift away from a

medical service-delivery model and adopt more FC practices, starting with developing a strong FPP. Working alongside rather than separate from parents allows EI providers to implement interventions that adhere to a family's priorities for their child and that are linked to their daily routines. FC practices build family capabilities and allow them to independently interact with their child in multiple settings.

Another area that is thought to contribute to the lack of engagement is mental fatigue. Although, there is no data that suggests how this may impact EI, the results of other studies have led researchers to imply this is a contributing factor among parents who have a child with a disability. There has been a rise in mental health concerns with both adults and children (CDC, 2018; CDC, 2019). Some researchers suggest that mental health concerns arise due to mental fatigue (Kaplan & Kaplan, 1989; Bratman et al., 2015). Parents who have a child with disability have additional layers that can increase the demands needed throughout the day. For these parents, it may be hard to attune during EI sessions.

Due to the increase need of spending time at appointments, therapy, and educational meetings, roughly 40% of parents of children with a disability will leave the workforce. The other 60% reported making workplace accommodations (Durairaj, 2019). Family life can be consumed by hours of therapy. For example, the average child with Autism Spectrum Disorder (ASD) receives over 58 hours of Applied Behavioral Analysis (ABA) a month (Linstead et al., 2017). This is not reflecting time that is consumed from redirecting behaviors, preparing meals for picky eaters, administrating medication, and

more. This leaves families with very little leisure time which may increase mental fatigue. Researchers have found that mothers of a child with ASD spend on average two additional hours of parenting per day than parents who have a child that is typically developing. Additionally, on any given day, these mothers were twice as likely to be tired and three-times as likely to experience a stressful event. The chronic daily stress faced by these mothers showed similarity to that for combat soldiers (Smith et al., 2010). This mental fatigue may also be a reason why some family members have lower participation rates when it comes to EI services. It is likely that some family members see this as a chance to have a break in their busy day. However, EI providers should work with the family to help lower their mental fatigue and help them to add strategies into daily routines, such as mealtime, riding in the car, or moving through transitions. Providers also should work with families during the most stressful part of the day with their child. Once families understand how to attune to their child during these times, it is likely that they will have less mental fatigue throughout the day.

Unfriendly Environments

Currently, the literature around EI natural environments focuses on services that take place in homes and center-based settings. There is very little information on services that take place in community settings such as parks, libraries, zoos, etc. Nevertheless, community settings should not be forgotten as places where a child in EI has the ability to interact with their same-aged peers who are typically developing and where parent needs beyond the home can be addressed.

In a national survey of 1,200 families with a child who has a disability conducted by the National Council of Disability (2010), parents reported needing assistance with a variety of parenting tasks in outdoor settings: 43% of parents would like help enjoying recreational activities with their child, 40% reported needing help "chasing and retrieving" their child, and another 40% reported needing help traveling outside of their home. In this report, parents also noted isolation due to missing out on activities because their child cannot fully participate, criticism and judgement from others who did not understand their child's disability and feeling like an outsider around parents who have a child that is typically developing. These are all areas that EI can support if services were provided in outdoor settings. Unfortunately, according to the findings reported by the Department of Education (2012), a majority of families receive EI services within their "home environment". The data reported in the National Early Intervention Longitudinal Study (NEILS) [Nelson, 2007]) also indicated that services take place 76% of the time in the child's home. Additionally, while 41% of children receive EI services in two or more settings, the most combined settings were homes and clinics. Only 8% of the EI population received services in an early childhood care center. The break down from the NEILS report suggests there is a significant gap in supporting children and their families in outdoor environments. When services take place in the home or clinic setting, parent needs listed above are hard to address. This is why providers should expand services to community environments so that parents receive support for different parenting tasks and so that children get more opportunities to interact with their typically developing same-aged peers. Limiting EI to indoor environments, not only limits a family's overall

interaction with different environments, it does little to overcome parents' fears of isolation or to support families becoming strong advocates for their child in everyday settings.

Unfriendly Materials

The materials, tools and toys used in families' homes creates another obstacle for EI. Typically, an EI provider comes into the home with a bag full of toys. EI providers report that they bring novel toys to help build the interest of the child and that can be used for specific tasks (Crawford & Weber, 2014). However, this approach is not realistic for many families, specifically if they do not have the funds to purchase similar toys. This creates a barrier for families to implement specific strategies throughout the week since they do not have the same materials as their EI provider (Williams & Ostrosky, 2019). Lastly, bringing in toys can put a strain on the family since children get upset when a provider leaves with the toys. This leaves the parents with a crying child at the end of each session (Crawford & Weber, 2014). To adhere to family-centered practices, some EI providers are now going "bagless" by using what is immediately available in the family environment. This can be a problematic technique when there are not many toys to use during intervention. However, this should not be an obstacle that stops an EI provider from using noncommercial materials. Many researchers have provided evidence that children use and manipulate natural and manmade items within their environments without the need for commercial toys (Brown 2012; Nwokah & Gulker 2006; Nwokah & Ikekeonwu 1998, 2007).

Another major benefit of Outdoor EI is the unlimited use of natural elements. Such stimuli may include, sticks, rocks, flowers, water, sand, etc. These materials can be used to drive curiosity. White and Stoecklin (2008) indicate that natural elements are open-ended materials that can enhance imagination, creativity, and problem solving. Outdoor environments provide a family with many "natural" toys. For example, a stick can be a person, a digging tool, or an imaginary creature. EI providers can help family members to implement everyday strategies with natural materials that are easily available outdoors. This could also relieve pressure on parents to buy expensive toys for interacting with their child.

Problems with Playground Equipment

A system barrier that goes beyond EI is the lack of appropriate playground equipment. DEC Recommended Practices (2014) view an important component of early childhood inclusion as the opportunities a child and his or her family have, regardless of ability, to fully participate in a broad range of activities and opportunities in the local community, including playground settings. Although, the interest in building accessible playgrounds has grown, many communities still lack this resource.

There are many challenges when it comes to playground play. First, children with physical disabilities may not be able to play on the playground equipment to the same extent as typically developing peers (Parkes, McCullough, & Madden, 2010). Second, some children, particularly those with ASD, may become overwhelmed outside. The stress levels of children with ASD was found to increase when outside and became even

higher when asked to interact with peers (Edimiston, Merkle, & Corbett (2015). In a survey conducted by Darcy and Dowse (2013), parents who had a child with an intellectual disability reported of a lack of playground and sporting activities that met the needs of their child. In another survey, parents of a child with disabilities reported that their child often plays alone (Stanton-Chapman Schmidt, in press). In the same study, parents reported that they need a playground to support their child's sensory needs. Parents also wanted the adapted equipment to be embedded within the playground so that *all* children could play together. Finally, in another study, parents reported apprehension about taking their child with disabilities to a public playground because they worried that their child would be bullied (Estell et al., 2009).

This literature review clearly revealed that a significant need exists to support children with disabilities outdoors and on playgrounds. Additionally, parents want guidance and resources on how to include their child at community parks. Many barriers make it hard for parents to take their children with a disability outside and especially to public playgrounds. This excludes the child from many learning opportunities and decreases their interactions with same aged peers. Public playgrounds can be a great resource for families to provide social and sensory opportunities to their children with disabilities and developmental delays. EI providers can help by accessing these outdoor environments and assisting parents in these endeavors and also by increasing public awareness and advocating for the need to support *all* families in community settings.

Low Levels of Family Social Support

EI providers who neglect to support families in community settings are denying social support for both parents and children. Malecki and Demaray (2002) define social support as "an individual's perceptions of general or specific supportive behaviors (available or enacted upon) from people in their social network, which enhances their functioning and/or may buffer them from adverse outcomes" (p.2). Social support has been linked to supporting well-being and optimism in families who have a child with a disability (Ekas, Lickenbrock, & Whitman, 2010). Family social support leads to more positive outcomes for children of divorce, children with learning disabilities, and children who are considered high-risk (Cowen, Pedro-Carroll, 1990; Kloomok & Cosden, 1994). The results of additional studies have shown that high levels of social support can reduce stress, enhance immune function, provide a sense of community, and overcome the negative impact of bereavement, job loss, and illness (Salovey at al., 2000; Shelley et al., 2000). This is particularly important to think about for families in EI. Many families are coping with the diagnosis of a child, redirecting intense behaviors, and learning how to address the medical needs of their child. Parents of a child with a disability are more likely to isolate themselves resulting in more limited social networks (National Council on Disability, 2010). For toddlers who do not have access to school environments, the parent is also responsible for integrating peer interaction (National Counsel of Disability, 2010). This result reduces opportunities for peer interaction and practice of social skills, which can contribute to challenges transitioning into preschool (Webster-Stratton, 2004).

These factors are compounded by the fact the EI services primary only occur in the home which prevents families from building social support within their community.

Supporting Rural Families

Many of the above barriers listed are particularly relevant for families residing in rural settings who have children with disabilities. The Center for American Progress reported that 59% of rural areas are considered "childcare deserts," meaning there are fewer childcare spots than there are children in needing them (Malik et alt., 2018). Additionally, there is a major shortage of physicians, therapists, and early childcare teachers in rural areas (Sukel, 2019; Goode, 2016; Malik et al., 2018). Rural families also are more likely to face poverty, a lack of medical and other resources, and poor housing conditions (CDC, 2017a). The CDC report (2017a) also noted that many rural families do not have access to parks, recreation centers, and libraries. These issues are important for EI professionals to think about since it may be that some of these issues can be addressed by more aggressive use of the outdoors to support the needs of the family and child. For example, EI providers can show families how to create toys with materials found in the family's backyard. Additionally, providers can help families locate more central meeting areas that can increase their connection with other families. Lastly, EI providers can be a source of advocacy to enhance the need of services in rural areas.

Technology Changing Family Interactions

Technology has changed the way people interact with each other, specifically parents and children. Parents find ease in turning on a TV screen and allowing their child to watch a show or play a game. However, this has created an epidemic. Children between the ages of zero to four are now being called the "touch screen generation" (Rosin, 2013). The use of technology for toddlers has been increasing, in which over 90% of toddlers have access to screens (American Academy of Pediatrics, 2016). Television now occupies 2.2 hours per day for children between the ages of zero and two (Nielsenwire, 2009). This is not including the additional time a toddler may be on a screen at a restaurant, in the car, or in a waiting room. Additionally, over 60% of parents have the TV on all day (Rideout et al., 2003). Software application (apps) developers are aware of this growing trend and are creating apps specifically for toddlers – claiming that a particular app is beneficial for children. Yet, researchers have indicated that technology hinders child development. George Troseth (2006) conducted a study where 24 two-year-old children watched an adult hide a stuffed dog on a live video monitor and others watched the exact same scene through a window. Both groups of children were released into the room and asked to find the dog. Almost all children who watched through a window found the toy, but the ones who watched on the monitor had a harder time finding the toy. This was one of the first studies demonstrating a "video deficit" suggesting that children learn best through human interaction. Furthermore, higher screen time has been correlated with higher risk of many mental and physical health problems such as anxiety, stress, depression, and obesity (Twenge & Campbell, 2018; Kimbro,

Brooks-Gunn, & McLanahan (2011). Lastly, many parents report that transitioning away from screen time ends in painful tantrums. This often then leads parents to give in and to allow their toddler to continue to use the device (Hiniker at al., 2016). In this way tantrums are negatively reinforced, and the screen is reinforced as a soothing object.

For children with disabilities, it is crucial that they reduce their amount of screen time since they are already susceptible to developmental delays. Unfortunately, parents also report spending less interaction time with their children due to technology. In a study conducted by Tomfohrde and Reinke (2016), over 300 mothers between the ages of 26-30 years old were surveyed on their reported use of social media while breastfeeding. Rather than taking this time to be in the moment with their child, 96% of these mothers reported technology use during this time. In another study, parents with children between the ages of five to 18 reported spending two hours and 17 minutes of personal time on their phones per day, compared to two hours and 41 minutes of screen-free playtime with their children (Haaland, 2019) Yet in the same study, 83% of parents believe it is important to have family time without screens and 79% reported that their relationship with their child would benefit if they all spent less time on their phones. Instead of screen time, parents also reported a desire spending this time with their children enjoying a hobby. Specifically, 54% of parents reported that they want to spend more time doing outdoor activities together as a family.

Providers of EI services play a vital role in addressing this by advocating and promoting healthy child development activities. Outdoor play is a way to address this

need. With parents' fears of the outdoors increasing (Louv, 2008), many need guidance for how to support their child and overcome their fear of playing outside.

New Direction in EI: Nature-Based Interventions

A conclusion drawn from the literature reviewed thus far, suggests that current EI service delivery models may need a new direction. Specifically, EI providers too often are using a medical model which focuses on interventions that EI providers value as important and neglects to include the actual needs of the family (Baril, 2018). This ultimately leaves the family with intervention strategies that do not generalize to everyday situations. Many EI providers argue that they use the medical model because of a lack in family engagement (Baril, 2018). However, as noted in prior studies, many families who have a child with a disability have higher stress levels and parents are more likely to be mentally fatigued (Linstead et al., 2017; Smith et al., 2010). Unfortunately, the current EI service delivery models also are less likely to reflect FC practices. Outdoor environments may be one place for promoting more effective EI services since they may enhance connections between individuals and help decrease mental fatigue (Kaplan & Kaplan, 1989; Bratman et al., 2015). It is likely that moving EI service sessions outdoors can enhance FC practices that ultimately can relieve family stress and lead to better child outcomes.

Additionally, many family members desire help for their child in outdoor environments. Specifically, parents want help with navigating playground equipment, socializing with peers, and safety awareness (National Counsel of Disability, 2010;

McCullough & Madden, 2010; Darcy & Dowse, 2013). Yet, there is very little data that reports how EI providers are supporting this need. Many parents report fear of the outdoors (Louv, 2008), and for parents who have a child with a disability it is likely these fears are intensified. Parents who receive skills that build family capacity in outdoor environments have the potential to increase their comfort level, allowing them to go outside with their child more often. Not only can the outdoors enhance child development, but it can increase the likelihood a child will be included with same aged peers who are typically developing. Overall, the evidence reviewed earlier certainly supports the hypothesis that outdoor environments can be a way to promote positive attitudes, adaptability, resiliency that can contribute to family growth, engagement, and social support. The next section will describe the literature on outdoor experiences that can overcome some of the current EI service delivery barriers.

Promotion of Positive Attitudes

Humans have been interacting with nature since the creation of time, but with urbanization and technology, humans are spending less time outdoors (Louv, 2008). Humans used to have a personal connection with nature by growing their own food, building shelter, and finding drinking water. However, in first-world countries, humans do not typically have to worry about these tasks. This decline in our overall interaction with nature is resulting in many physical and mental health issues (Sandifer et al., 2015; Keniger et al., 2013; Maller, 2009).

Families who are afraid to go outside, limit their children's ability to adapt to new environments. Children who are more comfortable in their home cling to their parents in new places. This may prevent a child from making new friends, accepting school, or exploring new things. Children who do not get to explore the outdoors have what theorists call "biophobia" (White, 2004). They tend to grow up preferring items that are man-made and view nature more as a disposable resource (White & Stoecklin, 2008). Theorists tend to believe that this fear is created from the adults as children naturally have a predisposition to explore the world around them (White & Stoecklin, 2008). For example, if a child witnesses their parent fearing a bug, the child will most likely mirror this reaction. Parents' fears can manifest to a point where the child wants to avoid outdoor play time. Kimbro, Brooks-Gunn, & McLanahan (2011) conducted a survey that explored whether outdoor play and television were associated with children's body-mass indexes. Within the survey certain factors were measured, such as neighborhood, types of dwelling, collective efficacy, and the environment outside the families' home. Participants included 1822 mothers who were part of the Fragile Families and Child Wellbeing Study. One factor highlighted in this survey of relevance to the current study is that 19% of mothers reported that they never allow a child to play outside because of fear. This is similar to Lee et al., (2015) who conducted a meta-analysis of 46 studies examining determinants of children's independent active free play. A major finding in that study was that parents' perceived safety concerns as the biggest barrier to children's active free play outside. Parents expressed the most fear about bullying, strangers, and traffic. For parents who have a child with disabilities, it is likely that these fears would

intensify. Although, this can be a scary time for parents, unstructured play time outside can promote adaptability, exploration, creativity, and resiliency.

Promotion of Child Resiliency

Biophilia is the belief that humans have an instinctual drive to connect with nature (Wilson, 1993). Biophilia has a role in emotion. When humans encounter living things there is a range of emotions from "attraction to aversion, from awe to indifference, from peacefulness to fear-driven anxiety" (Wilson, 1993, p.31). These emotions are thought to be linked to adaptive learning (Kahn & Kellert, 2002). Theorists believe that this is a subunit of humans' "adapted mind" (Barkow, Cosmides &Tooby, 1992; Kahn & Kellert, 2002). This is particularly important when thinking about child development. Children are learning to adapt to their environments through manipulation, emotion, and reaction. This is equally as important for parents. They are teaching their child how to interact with the outside world.

Nature can provide important opportunities for children and parents. For example, if a child witnesses their parent remaining calm around a bug then the child may allow the bug to crawl on their hand. Once the child feels safe around the bug, they can let their curious mind take over. This is such a simple life lesson with long-term implications. Everyday humans encounter events that trigger fear, but we learn to work through them. For example, parents and children are often scared going to school for the first time. But once they learn to adapt to this new reality they can grow and flourish. Ernst and Burcak (2019) conducted a pretest-posttest non-randomized comparison group design that

explored the influence of nature preschools. These schools include extended outdoor time, incorporate nature in the classroom set up (many windows, material made out of wood and stone) and use natural materials for learning. Four nature preschools in northern Minnesota and two non-nature preschools in northern Minnesota were selected for this study. Participants across both types of preschools shared similar demographic characteristics, had caring and responsive teachers, and attended programs that were child-center, play-based and developmentally appropriate programs. There were 34 nature preschool participants and 43 non-nature participants. Pretests and posttests were designed around four outcomes important in early childhood learning and development. The pretests were administered in the beginning of the academic year and posttests were administered towards the end of the academic year. Children who attended a nature-based preschool had significantly higher levels of curiosity and creative thinking then their counter peers who attended a high-quality, play-based, non-nature program. Additionally, the students who attended a nature-based program had greater growth from the pretest to the posttest in protective factors related to resilience. For children with disabilities, these are critical skills that may be promoted when they have access to an outdoor environment early in life.

Promotion of Outdoor Exploration

The outdoors can provide many simple life lessons. It is presumed that families and their children can learn to work through problems together in the outdoors. Some parents may need a little extra support when exploring the outdoors with their child.

Additionally, some EI providers may need a little more insight on the everyday interactions a family and their child encounter. Once the EI provider and the family gain a deeper understanding of each other's viewpoint, they can work together holistically. John Burroughs, nature essayist, cautions that "knowledge without love will not stick. But if love comes first, knowledge is sure to follow." An EI provider should be the one that enhances a family's knowledge and capabilities by supporting them through the journey of exploration. With the EI providers help, families can learn how to explore the outdoors that is modified for the child. Once a family feels safe in their new environment, they can allow their curiosity to take over. Some simple ways to start is by working on the child sitting in a sandbox with a same-aged peer, helping the family take neighborhood walks together, increasing safety awareness when on equipment, and coaching parents how to use assistive technology at the playground.

Promotion of Family Engagement

As discussed, many parents do not engage fully during EI sessions. Numerous factors may affect why parents may not involve themselves within sessions, but these may all be overcome by Outdoor EI efforts. It is likely that many parents are mentally fatigued from the extra everyday tasks due to having a child with a disability. In Attention Restoration Theory (ART), developed by Rachel and Stephen Kapaln in 1989, mental fatigue and concentration are hypothesized to improve with time spent in and/ or looking at nature. Theorists of ART believe that the more mental fatigue someone

endures the higher level of psychological stress they have (Kaplan & Kapaln, 1989) and the more exposure to nature is needed.

This is especially relevant for families of young children with disabilities. Gallagher and Hannigan (2014) compared depression rates in parents with a child who has developmental disability and parents who have a child typically developing. Parents who had a child with a developmental delay had significantly higher rates of depression. The rates of depression were even higher amongst parents whose children also had problem behaviors and chronic health risk. In another study, Bratman et al. (2015) conducted a group comparison to explore the effects of walking in a natural environment had on 38 adult participants who did not have any mental health disorders but resided in an urban area. The day of the study, all participants were asked to complete a self-report measure of rumination and a psychological scanning procedure. Next, half of the participants were randomly assigned to a 90-minute walk in either a natural environment or an urban environment. After the walk, all participants completed a follow-up self-report of levels rumination and an additional scan. The participants who walked in the natural environment had reduce rumination and neural activity in the subgenual prefrontal cortex (sgPFC). High levels of both rumination and sgPFC have been linked to anxiety, stress and depression. These results suggest that exposure to nature may improve mental health and well-being.

Based on these two studies, it might be proposed that families of young children with disabilities could benefit from more extended time in the outdoors and specifically

from EI sessions held in the outdoors. With the assistance of an EI provider, families can learn how to enjoy nature walks with their child, which may also support their personal health and well-being. Nature-based interventions may be particularly important for families who have a child with a disability since spending more time outdoors may allow parents to rejuvenate after a hectic day and allow their child to become calmer from the sensory experiences found outdoors. Furthermore, Outdoor EI may allow parents to decompress during an EI session leading to higher participation rates during the session.

Promotion of Social Support

Self-determination theory (SDT) suggests that all humans have a basic, instinctual need "for relating and connecting to others or to the world around them," (Weinstein et al., 2015, p. 1141). Deci and Ryan (2012) proposed that contact with nature fosters a sense of connection with the outside world that may generalize to other people. The establishment of a community garden is a trend that is becoming more popular within urban and school environments. Poulsen et al. (2014), explored the perceived benefits of participation in a community garden by conducting focus groups with 28 adults ranging in age from early twenties to late seventies from Baltimore, Maryland, who also ranged in gardening expertise from novices to experts. These researchers found that participants felt the community garden was an "urban oasis" that provided refuge and that revitalized their city neighborhood. Participants reported that the garden not only helped clean up neighborhoods, but also created a gathering place. Participants also reported stronger relationships with their neighbors through their shared learning experiences. Lastly,

participants reported individual growth in neighborhood pride and connection with nature.

It is possible that community gardens may similarly help parents of young children with disabilities. As mentioned earlier, many EI providers need ideas for implementing FC practices outdoors. Possibly holding sessions in a garden can help families and EI providers build trusting relationships while spending more time in the outdoors. Indeed, Outdoor EI settings have been associated with child improvements in six school readiness skills: (1) cognition and science, (2) physical development, (3) social and emotional development, (4) food and nutrition, (5) literacy and language, and (6) art and expression (Cordiano et al., 2019). Additionally, researchers have suggested other child learning and development benefits may accrue from authentic participation in garden work, including exploration through the senses, connection with the community, and greater engaged learning.

Similar benefits of outdoor experiences have been reported for social skills. Price (2019) analyzed the change in behavior of students ages 12 to 13 who had conduct, social, and emotional difficulties. Each student attended an outdoor learning intervention program one time per week for one whole school year. Participants were reported to make progress in the areas of self-management, social awareness, relationship skills, responsible decision-making, and decreased isolation. Data was measured by constant comparative method, which is an indictive data coding process used to categorize and compare data.

Overall, outdoor experiences do have positive effects on both children and adults. Important work has begun to show increased curiosity and creative thinking, adaptability in new environments, connection within communities, stronger social supports and reduce levels mental fatigue and stress (Ernest & Burcak, 2019; Kahn & Kellert, 2002; Poulsen et al., 2014; Deci & Ryan, 2012; Bratman et al., 2015). Encouraging families to engage in outdoor activities may help families build social networks. It may also allow both children and families to develop more interpersonal connections versus spending time inside or watching a video or TV screen. Outdoor EI experiences also may be a way to connect families of young children with disabilities and EI providers. Researchers who adhere to self-determination theory would suggest that relationships will be fostered through connections with the outside world and that such connections also could promote stronger FPPs.

Summary

Over the past decade, the number of children identified as having a developmental delay and/or disability has risen (CDC, 2017b). This has been accompanied by an increase in brain research that has given us a greater understanding of early childhood development. Researchers now understand that critical brain development occurs the most in the first few years of life (Owens, 2008). This research makes it clear that EI services are critical for improving outcomes in young children with disabilities. In fact, EI is now a part of mandatory education laws for all states. Intervening early in life is

essential to provide children and their families the skills needed to enhance development and reduce the needs of services as the child ages.

Also, mandated by law, is the environment where EI services take place. The natural environment is typically a term that is thought to take place in the child's home. However, more recently there has been a push to have natural literally mean "nature" which included outdoor environments for planning and implementing EI services for families and young children. EI sessions in outdoor environments can encourage parents to work on skills with their EI provider to enhance their child's goals. Outdoor EI services also may provide greater support in other areas as well, including, positive attitudes, resiliency, adaptability and family growth, engagement, and social support.

In order to further Outdoor EI, however, many barriers may need to be overcome. Many EI providers are using a medical service delivery model which results in a narrow lens of the child. EI providers who view a child from this angle miss important information such as family needs, family culture, and teaching the family the skills to implement. Furthermore, families reported that they need help navigating playground equipment, teaching their child safety awareness, interacting with other peers and parents, and feeling comfortable outside with their child (National Counsel of Disability, 2010; Parks, McCullough, & Madden, 2010; Darcy & Dowse, 2013). Through Outdoor EI, a provider can easily implement FC practices by guiding parents through some of these barriers. Once a family of a young child with disabilities feels more confident navigating

the outdoors, they will be more likely to go outside with their child, which is critically important for their child's development.

Researchers studying nature-based interventions also have found that spending time outside can also enhance relationships which may promote more positive family provider partnering. Nature-based researchers have suggested that spending time outside can enhance children's' creativity, adaptability to new environments, self-regulation, and social interactions with other children, and also leads to decreased screen time (Ernest & Burcak, 2019; Kahn & Kellert, 2002; Poulsen et al., 2014). Additionally, nature-based researchers have found activities in nature, such as gardening or hiking, can lead to decreased mental fatigue and stress by building greater community connections (Deci & Ryan, 2012; Bratman et al., 2015). These findings are all areas that align with the reason for promoting greater Outdoor EI supports.

There is ample support for the idea that Outdoor EI may be critically important for families with young children with disabilities. However, more data is needed to understand why this is not currently taking place. The results reported in the NEILS study suggested that more than 70% of EI services take place in the home (Nelson, 2007). Currently, it is unknown what percentage of EI services take place in outdoor settings. Thus, the first area to be addressed in this dissertation is what proportion and what types of EI practices are taking place in outdoor settings.

There also is a paucity of research on the perceived benefits and barriers that families' have regarding Outdoor EI. If more is known about what families perceive

about receiving EI services in outside settings, providers may be better equipped in the future to understand how to adapt EI services to take place outside with families. This in turn may help in the design of Outdoor EI that can overcome perceived barriers and can build upon perceived benefits. Thus, the second and third objectives for this dissertation is to gain more information on family perceptions of the negative and positive aspects of receiving Outdoor EI services. The ultimate goal is for this research to further inform and improve upon the future provision of early intervention services. Answers to the research questions posed here can help facilitate the future design of early outdoor interventions specific to improving the overall well-being of families and young children with disabilities.

Chapter 3: Research Methods

Study Design

A cross sectional survey design was used for this study. The purpose of the study was to assess current EI practices in outdoor settings with families who are actively involved in receiving EI sessions for a young child who is eligible for EI in the state of Colorado. The survey developed helped determine what EI services are currently received, as well as the family's perceived barriers (drawbacks) and benefits that might occur from such services. Due to the global pandemic, questions regarding how the pandemic has impacted family outdoor time will be assessed. This chapter begins with a description of the possible family participants for this study. Following this is a review of the phases used to develop and administer this new survey about Outdoor EI service-delivery.

Procedure for Getting Participants

There are 20 Community Center Boards (CCBs) in the state of Colorado. A letter was sent to the director of all 20 CCB locations in Colorado. Directors were asked to participate in the study by allowing their Service Coordinators (SC) to send an email to families on their caseload. 12 of the CCB's volunteered to participate, five declined due natural disasters (global pandemic and forest fires), and three resulted in no response after several attempts.

Additionally, the researcher participated in five team meetings across the state of Colorado to market the survey. These meetings took place through telehealth due to COVID-19 restrictions. SCs were asked to connect families to the link during their monthly check-ins and also to send the link to families during periodic and annual reviews. The researcher met individually with a member from the State of Colorado's Early Intervention program. This person distributed the surveys through a statewide listserv. All emails were sent in a letter format inviting participants to participate. A recruitment flyer was created for the SCs and the family that provided details of the survey along with a link for families to participate. See Appendix A for the recruitment flyers. Social exchange theory principles were used in the writing of the letter. Social exchange helps draw in participants by increasing the meaningfulness of their participation (Dillman et al., 2009). For this study, families were asked to participate and told that the findings from the survey will help enhance the program which in turn will allow future families to benefit from the findings.

Table 1: *CCB Break Down*

Name of CCB	Counties	Urban/ Rural/ Suburban
Blue Peaks Developmental Services	Saguache, Mineral, Rio Grand, Alamosa, Conejos, Costilla	Rural
Colorado Bluesky Enterprises	Pueblo	Rural
Community Connections	Dolores, San Juan, Montezuma, La Plata, Archuleta	Rural
Community Options	Gunnison, Delta, Montrose, San Miguel, Ouray, Hinsdale	Rural

Developmental Disabilities Resource Center	Gilpin, Clear creek, Summit, Jefferson	Urban, Rural
Developmental Pathways	Arapahoe, Douglas	Urban, Suburban
Eastern Colorado Service	Logan. Sedgwick, Morgan, Phillips, Washington, Yuma, Elbert, Lincoln, Kit Carson, Cheyenne	Rural
Envision	Weld	Rural
Foothills Gateway	Larimer	Rural
Horizons Specialized Services	Moffat, Routt, Jackson, Rio Blanco, Grand	Rural
Imagine!	Boulder, Broomfield	Urban, Suburban
Inspiration Field	Crowley, Otero, Bent	Rural
Mesa Developmental Services dba Strive	Mesa	Rural
Mountain Valley Developmental Services	Garfield, Eagle, Pitkin, Lake	Rural
North Metro Community Services	Adams	Urban
The Resource Exchange	Park, Teller, El Paso	Urban, Rural
Rocky Mountain Human Services	Denver	Urban
Southeaster Developmental Services	Kiowa, Bent, Baca, Prowers	Rural

Southern Colorado Developmental Disabilities Services	Huerfano, Las Anima	Rural
Starpoint	Chaffee, Fremont, Custer	Rural

Note. Information was found from following sites. Colorado County Designation. (2019). *List of the counties in Colorado and their Designations*. https://colorado.gov/pacific/sites/default/files/DC_STI_HIVPrev oloradCounty-Designations.pdf. Early Intervention Colorado. (2020). *Find your local community center board.* http://coloradoofficeofearlychildhood.force.com/eicolorado/EI_CCB?lang=en

The letter to SCs included all inclusionary and exclusionary requirements. To be included in the study a home-based caretaker must have been actively involved in EI sessions with an identified EI provider. Caretakers who were involved include parents, foster parents, grandparents, aunts/uncles, cousins, siblings, and family friends who are over the age of 18. The researcher transcribed the survey for Spanish speaking families so that they could be included. If families spoke any other language, they were included only if they were already using an interpreter during their EI sessions.

Families excluded from the survey included children only receiving EI services through community-based centers, such as an early childcare. See Table 2 for a list of inclusionary and exclusionary requirements.

Table 2: *Inclusionary and Exclusionary Requirements for Participants*

Inclusionary	Exclusionary
Currently Enrolled in EI	Not enrolled in EI - either has not started yet or just graduated from EI
Child is between the ages of 0-3	Child is over the age of 3

Speaks English, Spanish, or has an EI interpreter who can assist	Does not speak English or Spanish and does not have an interpreter to assist
Services take place at home with a designated caretaker	Services take place at a center-based program

Both families and SCs were offered an incentive. Every family who completed the survey was entered into a drawing for a $50-dollar gift card. To keep family responses anonymous, a second survey was created to collect the family's email address. All email addresses were saved in a password protected file and assigned a number. All numbers were entered into a drawing and 5 numbers were pulled for a $50-dollar gift card. Additionally, SCs were asked to notify the researcher when they sent the survey to 10 families. Every time the SC sent the survey to 10 families, the SC notified the researcher, and they were entered into a drawing for a $50-dollar gift card. Again, each email address was assigned a number and one number was pulled from the pile. Before surveys were sent out to participants phases one through three were executed. See the following subsections for the details of each phase.

Phase One: Planning, Literature Review

Phase one involved a thorough literature review of the topics and dimensions related to EI and outdoor supports. Specifically, service-delivery models, FPPs, EI materials, and natural environments were reviewed to determine current needs and barriers. Next, the research literature on nature and outdoor experiences was reviewed to assess how outdoor supports may facilitate EI service-delivery models, better meet family needs, and promote child development. This review provided a rationale for developing a

new survey on Outdoor EI to be administered to families who have young children currently receiving EI services.

Phase Two: Initial Item Development and Expert Review

After reviewing the literature, no established surveys were found that measure the constructs of interest to this dissertation, regarding current EI practices, parents' perceptions of Outdoor EI benefits, and barriers associated with Outdoor EI. Thus, a new survey was developed drawing from the literature on EI service-delivery models that recommend engagement in natural environments.

The initial items on the new Outdoor Early Intervention Survey (OEIS) were developed to assess current practices of Outdoor EI, perceived benefits derived from Outdoor EI, and perceived barriers to Outdoor EI. Hereafter, the title of the survey will be referred to as OEIS. The initial OEIS items are grouped into four sections with corresponding instructions for each section. Items in the first section asked caretakers to report current practices with OEIS. These items included questions such as how often they are going outside and where they are going outside. For parents who are not consistently receiving any EI services outside, a skip pattern directed them to similar sections with questions about perceived benefits and barriers of OEIS.

Items in the second section asked caretakers to report perceived benefits of OEIS. Benefit items were constructed to assess promotion of positive attitudes, child development & resiliency, understanding of the outdoors, and family support.

Items in the third section asked caregivers to report perceived barriers with OEIS. Barrier items were constructed to assess barriers that may occur with the provider, environment, personal, and child.

Finally, items in the fourth section asked caregivers to report demographic information. There are demographic questions specific to the child, family, and service provision. For the child, questions asked about age and eligibility. For the family, questions asked about their location, relationship to the child, language, and ethnicity/ race. Additionally, families were asked two sensitive questions: marital status and Medicaid services. Marital status was asked to determine if single parents report more challenges accessing the outdoors since they have more responsibility. Medicaid services were asked because parents of lower income report more challenges accessing the outdoors due to safety concerns (Kimbro, Brooks-Gunn, & McLanahan, 2011). Service provision questions asked about the types of services the family was receiving, length of services, and parent involvement.

Thus, the initial OEIS contained a total of 44 EI service-related items and 12 Demographic questions. Some items were answered with a checklist and some with a five-point Likert scale with the following anchors: Strongly Disagree (1), Somewhat Disagree (2), Neutral (3), Somewhat agree (4), and Strongly Agree (5). According to Johnson & Christensen (2017), fewer choices may not yield responses that are reliable and too many responses may confuse participants. A 5-point scale gives participants enough points to accurately illustrate real differences in perceptions, beliefs, and attitudes

that families may have without causing confusion. See Appendix B for the initial OEIS format.

The initial OEIS item pool and directions were evaluated to determine item clarity and face validity by two experts from the field of early childhood. Expert reviews are shown to be helpful in amplifying the content validity of scale and to determine support for construct validity and reliability is likely (Johnson & Christensen, 2017; Vogt, King, & King, 2004). The first review was completed by an individual at the state level with a focus on policy. The second review was completed by a practicing clinical director at a CCB with a focus on current providers and families. Both reviewers used the Question Appraisal System (QAS-99) Coding Form, which is a method for identifying and fixing miscommunication and other types of problems with questions. The QAS-99 is an eight-step process that determines whether a specific problem occurs within each question (Willis & Lessler, 1999). The eight steps assessed by the Expert reviewers were: (1) reading, (2) instructions, (3) clarity, (4) assumptions, (5) knowledge/memory, (6) sensitivity/bias, (7) response categories, and (8) other problems. Each section required the reviewer to determine if the question met satisfaction based on the eight steps by circling yes or no on the form. Reviewers circled "yes" if there was a problem with a question and they wrote detailed notes explaining the problem with the question. Reviewers circled "no" for questions that met satisfaction. See Appendix C for QAS-99 outline that was used to assess the initial item pool for the OEIS.

Based on the expert reviewer feedback a total of 12 questions were modified. Eight questions included word changes, two questions included additional responses

towards provider specific outcomes, and two questions included additional responses towards relevant family outcomes. Thus, only minor edits were made to the OEIS. No questions were removed during this process. Instead, changes occurred to address discipline specific information, relevant family concerns, and rewording questions for clarity. For example, both reviewers encouraged more responses in the question that asked "Please check all that apply. When outside, my provider supports me to..." Reviewers encouraged responses such as navigation of playground equipment, transitioning from new activities, and cognitive and play skills. Additionally, both reviewers believed that many families would have been confusion around the demographic questions that asked about child eligibility and types of services. After further consideration, these questions were not removed because it was believed that this information provided better information on supports needed for specific developmental domains. Specific examples were added to each response in attempt to reduce confusion, such as Cognitive (e.g., play skills, problem solving). One reviewer also suggested to remove the length of services from the inclusionary requirements because new families will still be able to provide ample data on perceived benefits and barriers regarding outdoor time. Therefore, length of services was removed from inclusionary and exclusionary requirements.

Phase Three: Initial Scale Revision, Cognitive Interviews, and Final Scale Revision

Edits from the expert reviewers were made and revisions were approved. Cognitive interviews took place after the approval of the OEIS revisions. Cognitive

interviews obtain feedback on the comprehensibility of all items from persons similar to the target audience for the survey (Fowler, 2014).

Cognitive Interviews. Cognitive interviews were conducted by the researcher on the updated OEIS. According to Fowler (2014), less than 10 interviews are needed to help establish reliability and validity of items. A cognitive interview recruitment email was created and sent to EI providers and families. See Appendix D for the parent letter and Appendix E for the EI provider cognitive interview recruitment letter. Participants were given an information form stating the purpose of the cognitive interview, that participation was voluntary, and there was minimal risk for participating. IRB approval was obtained prior to the recruitment of cognitive interview participants.

Participants included five parents and five EI providers to get a holistic view of the survey content. Parents included individuals who have recently graduated from EI because their children turned 3. EI providers were selected who were a current occupational therapist (OT), a physical therapist (PT), a speech and language therapist (SLP), a mental health professional, and an early childhood special educator (ECSE). Additionally, the researcher asked for volunteers who were bilingual in English and Spanish to help establish reliability and validity for the OEIS in Spanish. The overall participant demographics included 10 women; six identified as white, two identified as Latino, one identified as black; one identified as multiracial (See Table 3). Also, two of the participants were bilingual.

Table 3: *Demographics of Cognitive Interview Participants*

Characteristics	*n*	*%*
Relationship to EI		
Parent	5	50

ECSE	1	10
OT	1	10
PT	1	10
SLP	1	10
Mental Health	1	10
Gender		
Female	10	100
Male	0	0
Age		
25-30 years of age	2	20
31-36 years of age	5	50
37-41 years of age	2	20
42+ years of age	1	10
Ethnicity		
White	6	60
Black	1	10
Latino	2	20
Multiracial	1	1

During the cognitive interviews, participants met with the researcher and were asked to read the questions and talk through their thoughts as they answered questions out loud. The researcher asked questions regarding clarity of questions, phrasing of words, and understanding to why the interviewee picked a certain answer. Finally, the interviewees were given an opportunity to discuss questions that should be omitted or questions that should be added to the OEIS. All cognitive interviews took place through Zoom because of COVID-19 restrictions. All interviews were audio recorded and data was saved in a secure location that was password protected.

Final Scale Revision. Results from the cognitive interviews were compiled and used to evaluate the quality of each item and its comprehensibility. Three major change themes emerged: rewording of questions, conceptual changes, and providing specific examples. There were five questions that were reworded. For example, multiple participants thought I believe that playing outside will help increase outdoor activities

was easier to answer than I believe that the outdoors will allow me to engage in different activities with my family. There were 11 questions that were considered conceptual changes. Many of these conceptual changes were specific to Spanish speaking families. For example, during cognitive interviews both bilingual participants suggested that the word confidence may translate wrong in the question that asked, I think participating in outdoor activities with our provider will increase my confidence as a parent. Both participants thought this may come off negatively towards families and imply that they are not trusted as parents. Instead, they suggested changing the question to say, I think being involved in outdoor activities with our provider will help me learn how to support my child in different environments. There were five questions that required additional examples. Many families were confused by the term "things." Specifically, one question asked, I think there are things to do inside our home that are more important than going outside. Families reported they like the question but wanted more clarity. The question stayed the same, but examples were added to include academics, reading, and life skills.

In addition to question changes, 11 questions were added to the final survey. In the middle of this dissertation, the COVID-19 pandemic created many obstacles for EI and for families. To assess the impact COVID-19 had on responses, COVID-19 specific questions were added to the barriers' sections. In addition, both bilingual families wanted more questions around communication, values, and connections within their community. Families and providers also recommended questions around daily life stressors. For example, childcare for siblings was reported as a major barrier on why families do not go outside. Providers also wanted more questions around their discipline such as navigating

the playground and receptive language skills. Finally, there were two questions that were removed because families and providers did not see them relevant to the study. All participants agreed the Likert scales and checklists were appropriate. The bilingual participants also agreed the response selection for the Likert scales were appropriate for Spanish speaking families. This resulted in the final OEIS version that was administered to volunteer families currently receiving EI services in the State of Colorado. Items were grouped into the same four sections described earlier with corresponding instructions for each section. See Appendix F for a complete list of updated items included on the final version of the OEIS. The final survey included 53 items and 12 demographic questions.

Phase Four: Field Administration of the Final Scale

University of Denver IRB approval was obtained before the final OEIS was sent out. The final OEIS was sent to families across 12 CCBs beginning in September 2020 with several follow-up reminders. Participants in the field included caregivers who have a child with a disability currently enrolled in EI services in the state of Colorado. Participants were gathered as mentioned above. The end date for collecting the OEIS was November 2020. This phase allowed for a determination of the psychometric properties of the instrument, including the reliability of the measure, its underlying factor structure, and an analysis of differences across rural and urban environments and types of EI services.

Sample Size for the Field Administration

Researchers have many recommendations on the sample size required to conduct item and factor analysis, from a minimum of 100 participants (Kline, 1979) to 1000

participants (Comrey & Lee, 2013). A current study that recruited EI Colorado families and EI providers to participate in a survey had very low response rate (Cole, Pickard, & Stredler-Brown, 2019). Only two families completed the survey and 112 EI providers completed the survey. One possible reason for this low response rate is that the researchers of this survey asked administrators to send the survey out to participants. It is believed that administrators have the least amount of contact from families which in turn affected the low response rate. To combat this issue, in this study, SCs were asked to send the request to participate in the OEIS to families they were currently serving. This means that in the current study families were recruited from the person with whom they have the most direct contact in regard to receiving EI services.

For this study, 152 participants completed the English version of the OEIS. Even with several attempts to recruit Spanish speaking families only four families completed the Spanish version of the OEIS. The response rate is unknow due to the means in which the survey was distributed. Not every CCB and not every SC engaged in the distribution of the survey; therefore, making it hard to predict how many families actually received the invitation. DeVellis (2017) has suggested that in scale development a modest sample size of 150 subjects might be appropriate. Furthermore, DeVellis (2017) remarked that, "it is certainly not uncommon to see factor analyses used in scale development based on more modest sample (e.g., 150 subjects)" (pp. 203-204).

An incentive was offered as described earlier to increase participation rates. The researcher checked in with the SCs one month after distribution and asked them to send out the survey again. There were two rounds of distribution of the survey.

Procedures for the OEIS Field Administration

The OEIS was formatted and administered as an online Qualtrics format. Family participants who were interested in voluntarily completing the OEIS were provided a URL link with an invitation to participate. When participants clicked on the link, an informed consent form appeared. After reading the consent, participants had the option to participate or not. Participants who voluntarily agreed to participate were then directed to the actual survey. All responses were anonymous, participants were not forced to answer any questions, and were able to withdraw at any time.

Responses to the scale were exported from Qualtrics into a Statistical Package for the Social Science (SPSS). All data was kept confidential in a password-protected file only accessible to the researcher and faculty sponsor.

Chapter 4: Results

In this chapter, the characteristics and descriptive data associated with the final field administration of the OEIS are reported. Due to COVID-19 restrictions, service delivery models changed. Providers were unable to meet with families face-to-face and all services were provided through telehealth. This impacted the first research question, *what is the current state of Outdoor EI?* There was an under representation of the current state because very little families reported having the opportunity to go outside with their provider because of COVID-19. This question was removed as a primary research question and results in this section are discussed antidotally in Chapter 5. Analyses associated with the two primary research questions and associated hypotheses are presented:

1) What are the perceptions of desirability regarding Outdoor EI?
    a. What are the perceptions of desirability between rural, urban, and suburban areas?
    b. What are the perceptions of desirability between services?
2) What are the perceptions of barriers regarding Outdoor EI?
    a. What are the perceptions of barriers between rural, urban, and suburban areas?

b. What are the perceptions of barriers between services?

Hypothesis 1: Families perceive that going outside with their EI provider will help with: positive attitudes, children's development and resiliency, family understanding of the outdoors, family engagement, and family support. It also is expected that no differences will be found in terms of responses given by parents across rural, urban or suburban areas and different child support services.

Hypothesis 2: Families perceive barriers that prevent them from going outside with their provider, environmental factors, and personal and child challenges. It also is expected that no differences will be found in terms of responses given by parents across rural, urban or suburban areas and different child support services.

Description of the Final Sample

There were 152 participants in the final field administration. The majority of participants were located in urban environments, with 84 (64%) in urban, 39 (30%) in rural and only seven (6%) in suburban locations. 99 (72%) of children were 20 months or older followed by 17 (12%) between the age of 16-19 months, 16 (11%) between the ages of 12-15 months, 3 (2%) between the ages of 8-11 months, 2 (1%) between the ages 4-7 months, and 3 (2%) between 0-3 months. To be noted, there were 232 services reported because many families have more than one provider. Speech Language Pathologists were reported as the most frequent EI service at 87 (37%) followed by 60 (26%) Occupational Therapists, 47 (21%) Physical Therapists, 21 (8%) Social Emotional Provider, 9 (4%) Developmental Interventionists, and 8 (3%) other. A great number of participants

reported their race as white, with 119 (66%), followed by 24 (13%) Hispanic/Latino, 14 (8%) Asian, 8 (4%) Black or African American, 7 (4%) multiracial, 5 (3%) American Indian and Alaska Native, 2 (1%) prefer not to answer, and 1 (1%) Native Hawaiian and Other Pacific Islander. According to the U.S. Census (2019), these percentages represent Colorado's demographic population except for the Hispanic and Latino population. Even with the survey translated in Spanish, the data underrepresented this population around 10%. Based on EI Colorado Participant Characteristics (2016), the OEIS was underrepresented for children under the age of 12 months. It is assumed that this population was not as interested in the survey due to children being too young for many outdoor activities and COVID-19 impacting the desire to take a newborn outside. Additional demographic information can be found in Table 1.

Table 1: *Demographics of Interview Participants*

Characteristics	*n*	*%*
Location		
Rural	39	30
Urban	84	64
Suburban	7	6
Qualified services		
Cognitive	32	11
Communication	98	33
Social Emotional	44	15
Adaptive	31	10
Motor	19	56
Multiple Areas	34	11
I don't know	3	1
Service provider		
Speech and Language Pathologist	87	34
Developmental Interventionist	9	21
Occupational Therapist	60	24
Physical Therapist	47	18
Social Emotional Provider	21	8
Multiple Areas	11	4

Other	8	3
I don't know	0	0
Length of services		
0-3 months	12	12
4-7 months	36	26
8-11 months	25	18
12-15 months	25	18
16-19 months	18	12
20 or months	19	13
Age range of child		
0-3 months	3	2
4-7 months	2	1
8-11 months	3	2
12-15 months	16	12
16-19 months	17	12
20 or months	99	71
Relationship to child		
Biological parent	130	92
Adoptive parent	3	2
Foster parent	1	1
Grandparent	4	3
Aunt/uncle	1	1
Prefer not to answer	1	1
Type of insurance		
Private/employer	86	62
Medicaid	46	32
Other	5	4
Prefer not to answer	3	2
Race/ethnicity		
White	119	66
Black or African American	8	4
Hispanic/Latino	24	13
Asian	14	8
Native Hawaiian and Other Pacific Islander	1	1
American Indian and Alaska Native	5	3
Multiracial	7	4
Prefer not to answer	2	1
Marital status		
Married	112	80
Co-habitation	12	9
Divorced	4	3
Separated	3	2
Single	5	4
Prefer not to answer	4	2

Exposed to more than one language		
Yes	42	30
No	98	70
English primary language		
Yes	131	94
No	9	6
Prefer not to answer	1	1

Data Cleaning

The goal of data cleaning is to provide a data set that is consistent enough to allow for accurate and precise analysis. Of the initial 152 records, 9 were missing more than 5% of total data points which appeared to be a random subsample of the overall sample. Therefore, those 9 records were deleted leaving 143 total records for analysis (Tabachnik & Fidell, 2013). 15 of these 143 records were missing data for the location variable only, therefore location data were imputed for the analysis used to assess the first hypothesis (n = 128).

Statistical Analyses

For this dissertation data was analyzed across the entire sample to describe the overall benefits and barriers the respondents gave regarding outdoor EI. After these two sets of sub analyses were conducted to address two sub questions in the study. The first was to examine benefit and barrier differences across respondents from different locations. The second was to examine benefit and barrier differences across respondents receiving different types of EI services. Each of these analyses will be discussed separately.

All analyses were conducted using SPSS 26 using items 9-53 (n = 143). Items 1-9 were dropped due to low response rate per COVID-19 restrictions. These questions were

designed for the research question *what is the current state of Outdoor EI?* Instead, items 1-9 are discussed antidotally in the following chapter.

First, item analyses were conducted to examine the survey's reliability and "to evaluate the performance of the individual items so that appropriate ones can be identified to constitute the scale" (DeVellis, 2017). This tests the reliability and validity of the items to ensure they are measuring the intended constructs accurately from the responses given by the parents. After results from the item analyses were obtained, the hypotheses were tested by conducting a series of *t*-tests which are discussed in detail in subsequent sections.

Total scores were used in all analyses. The total score for the OEIS was calculated by adding all the responses for each individual item (possible range = 0–176) to allow for examination of the overall perception of outdoor EI by all respondents. Then the responses were separated by each subscale and total scores were calculated by adding the responses to the subscale items for each individual. The possible range for the Benefits Subscale Score (BEN) was 0–52, and the possible range for the Barriers Subscale Score was 0-124 (BAR).

Descriptive Statistics

Next, descriptive analyses were conducted through SPSS, and the number of respondents who answered the item, the means, standard deviations, and skewness and kurtosis are provided below (Table 2). Examination of skewness and kurtosis estimates indicated no violation of univariate normality for all three scales. However, visual inspection of histograms (Figures 1-3), Q-Q plots and Shapiro-Wilk analyses indicated

violations of normality for the Benefits subscale. No normality violations were indicated for the overall OEIS or Barriers subscale. Outliers were identified using boxplots and were defined as 1.5 times the interquartile range above the third quartile (Q3) or 1.5 times below the first quartile (Q1). Six total outliers were revealed upon examination of boxplots. One outlier below Q1 was found for the overall OEIS (1.0%), two outliers below quartile two (Q2) was found for the Benefits subscale (1.3%), and three outliers for the Barriers subscale with one below Q1 (1.0%), and two above Q3 (1.3%). Typically, data imputation is used when more than 5% of total data points are missing. Therefore, the researcher determined it was essential to retain all outlier cases to ensure the overall data would capture the breadth and depth of participants' perspectives and experiences (Tabachnick & Fidell, 2013). The scale responses were coded as follows: 0 (Neither Agree or Disagree), 1 (Strongly Disagree), 2 (Disagree), 3 (Agree), and 4 (Strongly Agree). Summary statistics can be found in Table 2 and 3.

Table 2 : *Descriptive Statistics*

Item	N	Mean	Std. Deviation	Skewness	Kurtosis
9	143	3.7	0.848	-3.598	12.99
10	143	3.78	0.77	-4.291	18.388
11	143	3.02	1.489	-1.347	0.189
12	143	3.16	1.248	-1.741	1.956
13	143	3.2	1.296	-1.73	1.721
14	143	3.56	0.954	-2.763	7.445
15	143	3.32	1.22	-1.987	2.789
17	143	2.84	1.461	-1.172	-0.123
18	143	2.55	1.63	-0.733	-1.151
19	143	2.3	1.645	-0.465	-1.454
20	143	2.62	1.565	-0.804	-0.942
21	143	2.31	1.584	-0.498	-1.354
22	143	2.97	1.421	-1.371	0.421

23	143	1.31	1.152	0.887	0.055
24	143	1.18	1.052	1.099	0.961
25	143	1.11	0.505	2.199	9.76
26	143	2.77	1.428	-0.719	-1.038
27	143	1.18	0.668	1.648	4.683
28	143	1.86	1.242	-0.11	-1.142
29	143	1.21	0.626	1.384	2.427
30	143	1.13	0.816	0.935	1.138
31	143	2.27	1.311	-0.143	-1.227
32	143	1.38	0.91	0.541	-0.277
33	143	1.5	0.918	0.342	-0.798
34	143	1.24	0.721	1.661	3.372
35	143	1.68	1.018	0.845	-0.182
36	143	1.37	0.878	0.657	0.256
37	143	1.21	1.04	0.482	-0.46
38	143	1.28	0.791	1.016	1.043
39	143	1.78	1.182	0.248	-1.096
40	143	1.03	0.323	3.269	21.692
41	143	1.81	1.204	0.174	-0.944
42	143	1.49	1.027	0.602	-0.463
43	143	1.76	1.138	0.48	-0.72
44	143	1.2	0.656	1.584	3.632
45	143	1.06	0.331	1.057	5.819
46	143	1.26	0.748	0.561	0.28
47	143	1.22	0.797	0.181	-0.445
48	143	1.45	1.092	0.35	-0.738
49	143	1.06	0.486	2.011	8.269
50	143	1.22	0.849	1.25	1.85
51	143	1.22	1.219	0.509	-1.175
52	143	1.76	1.21	0.202	-1.047
53	143	0.99	0.524	2.671	16.079

Figure 1
Histogram of OEIS

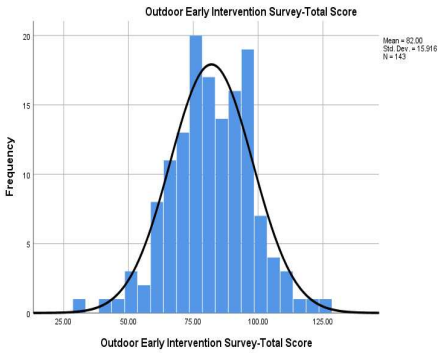


Figure 2
Histogram of Benefits Subscale

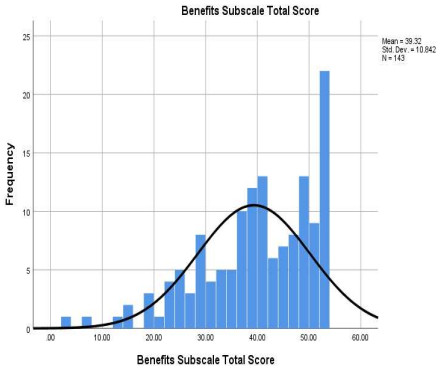


Figure 3
Histogram of Barriers Subscale

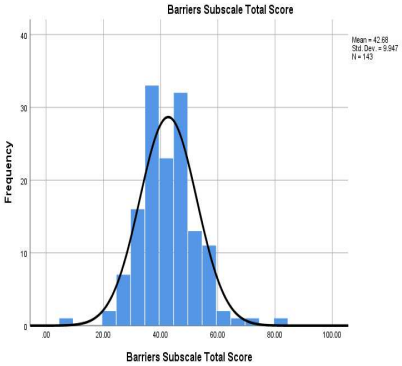


Table 3

Descriptive Statistics for Study Variables

	n	*Min*	*Max*	*M*	*SD*	*Skewness*	*Kurtosis*	Shapiro-Wilk		
								Statistic	*df*	*p*
OEIS-TSS[a]	143	31	124	82.00	15.92	-0.24	0.39	0.994	143	.771*ns*
OEIS-Benefits SS[b]	143	3	52	39.32	10.84	-0.83	0.31	0.923	143	0.000
OEIS-Barriers SS[b]	143	7	82	42.68	9.95	0.36	2.13	0.973	143	0.006
Location	128	-	-	-	-	-	-	-	-	-
Service Provider	141	-	-	-	-	-	-	-	-	-

[a]OEIS-TSS = Outdoor Early Intervention Survey-Total Scale Score. Total Scale Score (TSS) was calculated by the summation of the responses for each individual OEIS item (possible range = 0–176).

[b]OEIS subscale scores were calculated by the summation of the responses for each individual subscale item (possible range = 0–52 for Benefits Subscale Score (SS); 0-124 for Barrierss SS).

*$p < .05$. **$p < .01$. ***$p < .001$. *ns* = nonsignificant.

Survey Reliability and Item Analysis

Reliability and item analysis of the Benefits subscale was conducted using items 9-22 (item 16 was removed due to an open-ended response). Items 1-8 and item 16 were omitted due to low number of responses. This was attributed to COVID-19 restrictions prohibiting providers from in-person sessions. Analyses of the Barriers subscale was conducted using items 23-53. Therefore, a total of 44 items were used to assess each subscale of interest by conducting separate item analyses.

Internal consistency of each subscale was analyzed first to determine reliability in this sample of respondents. The Cronbach's alpha estimate revealed very-strong correlation between items for the Benefits subscale ($\alpha = .87$). Similarly, a strong correlation was indicated for the Barriers subscale ($\alpha = .76$). These are good correlations which indicate that the responses were consistent across respondents and across the items. This means that the benefits subscales measured the perceived benefits derived

from Outdoor EI, and the Barriers subscale measured the perceived barriers to Outdoor EI, which were the constructs they were intended to measure. Therefore, the response data is reliable for use with statistical analyses.

Item analysis was conducted to identify non-performing items using a 0.70 Cronbach's alpha estimate as minimum criterion for item retention. In an attempt to reduce the number of items, item-total statistics were analyzed and revealed the following ranges: Benefits (0.850-0.865), Barriers (0.744-0.768). Given that no non-performing items were indicated by the item-total statistics, all items and responses were retained for further analysis. Tables 4-5 display reliability and item analysis results

Table 4
Reliability and Item-Total Statics for Benefits Subscale

Benefits Subscale Items (α = .865)	Cronbach's Alpha if Item Deleted
9. I think going outside with my child is important.	0.863
10. I think outdoor learning is important.	0.864
11. I want to go outside with our provider.	0.851
12. Spending time outside will help my child achieve their IFSP outcomes.	0.853
13. Spending time outside with our provider will help me support my child's development.	0.850
14. Spending time outside with our provider will allow my child to play with natural materials (e.g., sticks, sand, rocks).	0.859
15. I think being involved in outdoor activities with our provider will help me learn how to support my child in different environments.	0.852
17. Spending time outside with my provider can help me increase my parenting skills.	0.849
18. Spending time outside with my provider will keep me engaged in my child's session.	0.847
19. Spending time outside will keep me focused on the session.	0.852
20. I believe that having more time outside will allow my child to play with other children their age.	0.861
21. I believe that playing outside will allow me to connect with other parents.	0.865
22. I believe that playing outside will help increase family activities.	0.857

Table 5

Reliability and Item-Total Statics for Barriers Subscale

Barriers Subscale Items (α = .762)	Cronbach's Alpha if Item Deleted
23. My provider doesn't give me the choice to go outside.	0.760
24. My provider has avoided going outside.	0.759
25. It is hard for me to communicate with my provider.	0.759
26. COVID-19 has prevented us from going outside with our provider.	0.760
27. My neighborhood is not safe for outdoor play.	0.758
28. The weather prevents us from going outside.	0.755
29. We do not have a place close to us that allows us to play outside.	0.761
30. It is hard to communicate with other families (e.g., language and social barriers).	0.756
31. COVID-19 has prevented us from going outside.	0.747
32. I am too tired to go outside.	0.747
33. My work (e.g., housework, job) prevents us from going outside.	0.750
34. I fear going outside because of the unknown.	0.756
35. I fear having my child play outside because of safety concerns (e.g., running in the street, fal	0.744
36. I give my child screen time instead of going outside because it is easier.	0.747
37. I think there are things to do inside our home that are more important than going outside (e.g	0.758
38. I worry about what other people think of my child.	0.759
39. I need extra support when going outside (e.g., someone helping with siblings).	0.752
40. I do not think outdoor time is important.	0.760
41. I do not feel connected with my neighbors.	0.761
42. I avoid taking my child outside because they may not listen to my commands.	0.745
43. COVID-19 has made me afraid of going outside with my family.	0.753
44. My child has fears going outside (e.g., loud sounds, unfamiliar people and places).	0.761
45. My child doesn't like going outside.	0.762
46. My child would rather have screen time than be outside.	0.758
47. My child would rather do other activities than go outside (e.g., Legos, art, Play-Doh).	0.755
48. My child doesn't know how to interact with other peers when we are outside.	0.753
49. My child has medical reasons that prevent us from going outside.	0.766
50. My child cannot navigate the playground or other outdoor environments due to their physica	0.768
51. My child is distracted outside (e.g., does not focus on the EI session).	0.761
52. My child has a hard time transitioning from one activity to another (e.g., outside back inside	0.749
53. My child is afraid to go outside because of COVID-19.	0.763

Research Question 2: What are the Perceptions of Desirability Regarding Outdoor EI?

To answer the first sub question about differences across geographical location, the sample was split into two groups: rural/suburban (n = 47) and urban (n = 81). Rural

and suburban were combined due to suburban only having seven responses and to create a more even distribution between sample sizes. It is believed that the gap between rural and urban populations were caused by several reasons. First, Colorado had three of the largest documented wildfires during the distribution of the survey. This had a significant impact on the rural communities. Second, the global pandemic may have caused underlining issues. Third, many rural CCBs lack support services and current SCs and providers are already overworked. The overall *n* for geographical location was 128. This response was left as an optional answer for IRB and family comfortability. It is assumed that 15 individuals did not feel comfortable sharing their location which explains the reduction in *n* size. To answer the second sub question about differences across child services, the sample was split into two groups: single provider ($n = 60$) and multiple providers ($n = 82$). The overall *n* for service providers is 142. In order to conduct accurate *t*-tests, the sample size required a closer range of distribution. Therefore, services were combined to either a single provider or multiple providers. This was similar issue with a current EI study, EI Colorado Participants Characteristics (2016), researchers combined services to either single or multiple providers for a more even distribution for *t*-test analysis. It is assumed that children who have multiple providers need additional developmental support than those who have a single provider.

To evaluate hypothesis one, the non-parametric Independent Samples Mann-Whitney-U test was used due to normality violations, as discussed in the Descriptive Statistics section. When the assumption of normal distribution has not been met, the Mann-Whitney test is a non-parametric equivalent of the independent *t*-test (Field, 2017).

Therefore, the researcher used one Mann-Whitney test to consider if there were differences between respondents from rural/suburban or urban settings. A second Mann-Whitney test was conducted to consider if there were differences between respondents regarding which services were provided to their children.

The dependent variable for the first model is perceived benefits of OEIS and the independent variable is location. The dependent variable for the second model is perceived benefits of OEIS and the independent variable is service provider.

Total scores for the Benefits subscale and an *a priori* alpha of .05 were used to assess differences between responses given by parents regarding geographical location residence. Effect sizes were calculated using the following equation and benchmarks (Cohen, 1992; Rosnow & Rosenthal, 2005):

$$r = \frac{Z}{\sqrt{N}}$$

Table 6
Pearson's r Effect Size Benchmarks

Effect size	*r*
Small	0.10
Medium	0.30
Large	0.50

Cohen, 1992

Independent Samples Mann-Whitney Results

Benefits. No statistically significant differences in perceptions of the benefits of Outdoor EI for urban participants (M_{rank} = 64.95) compared to rural/suburban participants (M_{rank} = 63.72) were indicated (U = 1867.00; z = -1.81; *ns;* $r_{Location}$ = -0.16). Similarly,

perceptions of the benefits of OEIS for participants whose children received services from a single provider (M_{rank} = 70.83) did not differ significantly from those receiving services from multiple providers (M_{rank} = 71.99) in this sample (U = 2,500.00; z = 1.66; *ns;* $r_{Provider}$ = 0.15). Effect sizes were very small for location and provider groups.

$$r_{(Location)} = \frac{-1.81}{\sqrt{128}} = -0.16 \qquad r_{(Provider)} = \frac{1.66}{\sqrt{128}} = 0.15$$

Figure 4
Benefits Score Distribution by Location

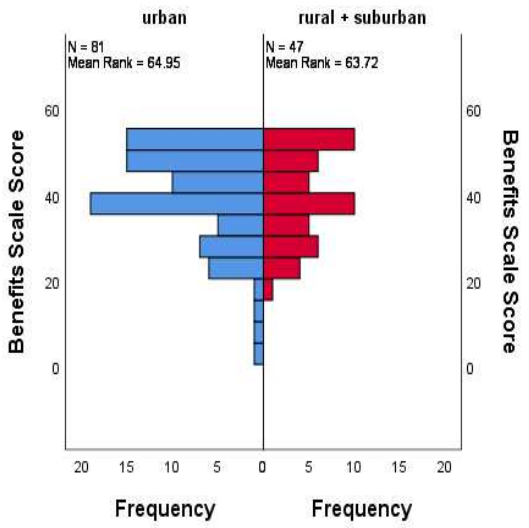


Figure 5
Benefits Score Distribution by Provider

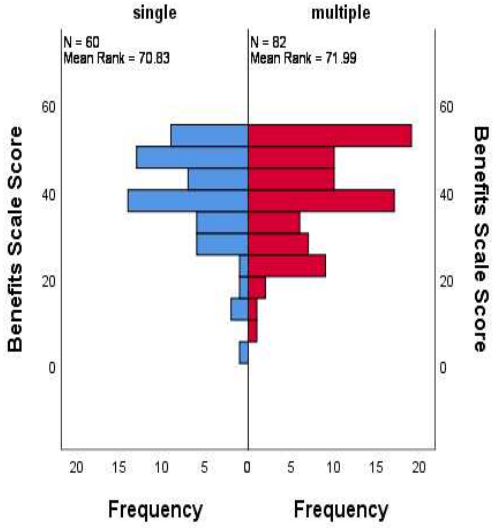


Figure 6
Number of Respondents by Location

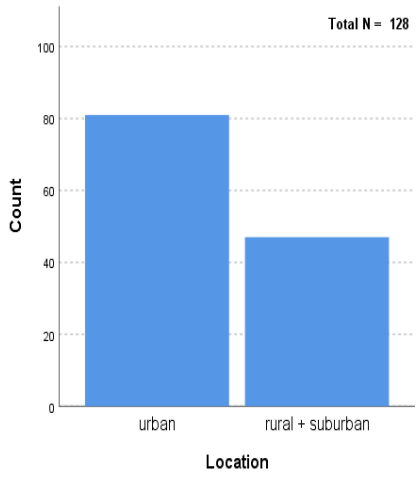
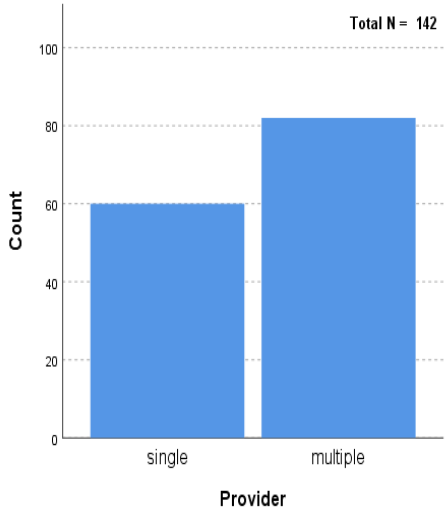


Figure 7
Number of Respondents by Provider



Benefits Summary

These results suggest that there are no differences between perspective benefits for participants located in different geographical regions or by the number of providers. The overall mean for the benefits section was M=3.0, suggesting that family were more likely to agree with many of the statements. For example: *I think going outside with my child is important (*M=3.7), *I think outdoor learning is important* (M=3.8), *spending time outside with my provider will support my child's development* (M=3.2), and *I think being involved in outdoor activities with our provider will help me learn how to support my child in different environments* (M=3.3). This data suggests that families perceived that going outside with their EI provider will help with positive attitudes, children's development and resiliency, family understanding of the outdoors, family engagement, and family support.

Research Question 3: What are the Perceptions of Barriers regarding Outdoor EI?

Similar to the first question, to answer the first sub question about differences across geographical location, the sample was split into two groups: rural/suburban (*n*=47) and urban (*n*=81). Again, suburban was combined with rural for even disruption for sample sizes. The overall *n* for geographical location was 128. To answer the second sub question about differences across child services, the sample was split into two groups: single provider (*n* = 60) and multiple providers (*n* = 82). The overall *n* for service providers is 142. In order to conduct accurate *t*-tests, the sample size required a closer range of distribution. Therefore, services were combined to either a single provider or multiple providers.

There was no violation of normality for the Barriers subscale data, therefore independent samples *t*-tests were conducted to test this hypothesis. The independent variable for the first model was perceived barriers of OEIS and the dependent variable was location. The dependent variable for the second model was perceived barriers of OEIS and the independent variable was service provider. Total scores for the Barriers subscale and an *a priori* alpha of .05 were used to assess differences between responses given by parents regarding type of child service provider. Effect sizes were calculated using the following equation and benchmarks (Cohen, 1992; Rosnow & Rosenthal, 2005):

$$r = \frac{t^2}{t^2 + df}$$

Table 7

Pearson's r Effect Size Benchmarks

Effect size	*r*
Small	0.10
Medium	0.30
Large	0.50

Cohen, 1992

Independent Samples T-tests Results

Barriers. Results for geographic location indicated similar perceptions of Outdoor EI benefits by both the rural/suburban group and the urban group ($M_{(rural/suburban)}$ =41.80, $SE_{(rural/suburban)}$ = 1.228; $M_{(urban)}$ = 43.60, $SE_{(urban)}$ = 1.233). Assumption of Equal Variances was measured by the Levene Statistic (F = 1.09, p = .298) and was greater than .05, therefore the null hypothesis of equal means across groups was not rejected (Field, 2017). Based on these findings, the researcher can conclude there is no statistically significant difference in perceived Outdoor EI barriers between the rural/suburban group and the urban group (t_{126} = 1.097; p = 2.75; 95% CI [-1.65, 5.75]). This was supported by a very small effect, which means location has very little influence on perceived barriers of outdoor EI (r = .01).

$$r = \frac{1.097^2}{1.097^2 + 126} = \frac{1.203}{127.203} = .01$$

Results for service provider suggested comparable perceptions of EI benefits by both the single provider and the multiple providers group ($M_{(single)}$ = 44.32, $SE_{(single)}$ = 1.44; $M_{(multiple)}$ = 41.63, $SE_{(multiple)}$ = 0.97). Again, the Levene Statistic was greater than .05 (F = 1.69, p = .195), therefore the null hypothesis of equal means across groups was not rejected (Field, 2017). The difference was not significant between provider groups

(t_{140} = 1.60; p = .112; 95% CI [-.633, 5.998]), and the effect size was very small, meaning that number of providers has very little influence on perceptions of outdoor EI benefits (r = .02).

$$r = \frac{1.60^2}{1.60^2 + 140} = \frac{2.56}{142.56} = .02$$

Figure 8
Barriers Score Distribution by Location

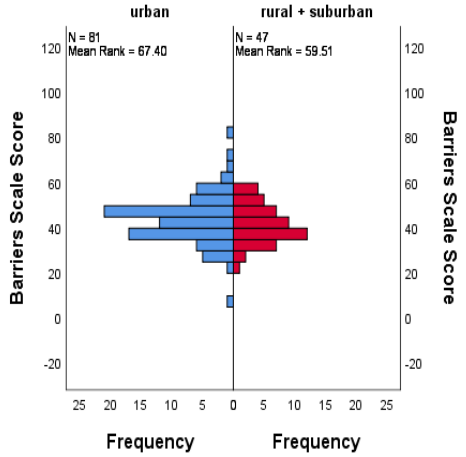


Figure 9
Barriers Score Distribution by Provider

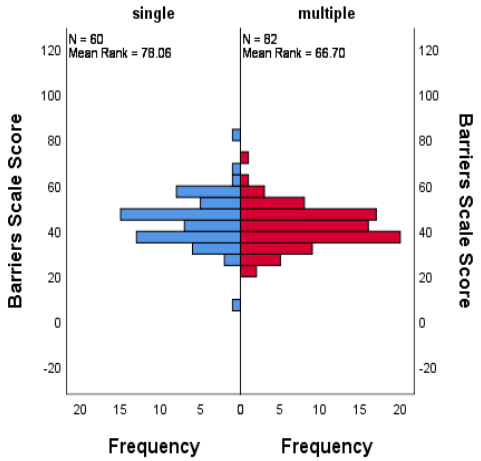


Figure 10
Number of Respondents by Location

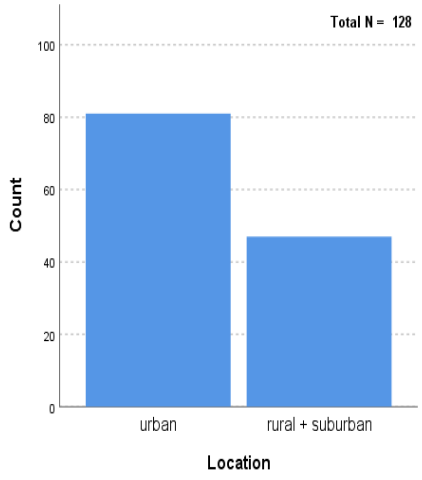
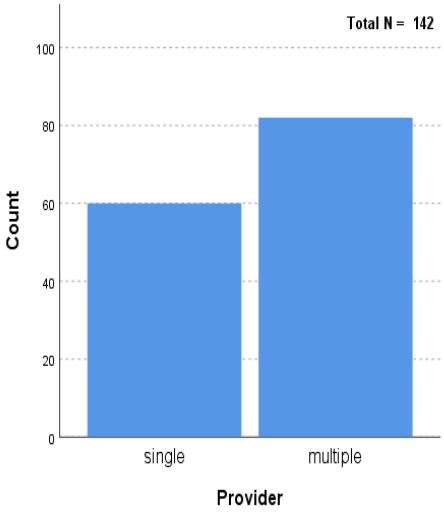


Figure 11
Number of Respondents by Provider



Barriers Summary

These results suggest that there are no differences between perspective barriers for participants located in different geographical regions or by the number of providers. The overall mean for barriers section was M=1.4, suggesting that family were more likely to disagree with many of the statements. For example: *my neighborhood is not safe for outdoor play* (M=1.1), *we do not have a place close to us that allows us to play outside* (M=1.2), *I am too tired to go outside (1.38)* and *my child is distracted outside* (M=1.2). This data suggests that families do not perceive many barriers related to their provider, the environment, themselves, or their child that would prevent them from going outside.

Summary of Results

The results of the study in this chapter include descriptive statistics, reliability, item analysis, and *t*-test. Items 1-8 were removed due to COVID-19 restricting service delivery and item 16 was removed due to the open-end responses. Items 9-15 and 17-53 were kept for analysis. Item analysis showed a strong correlation. This means that the benefits subscales measured the perceived benefits derived from Outdoor EI, and the Barriers subscale measured the perceived barriers to Outdoor EI, which were the constructs they were intended to measure. The non-parametric Independent Samples Mann-Whitney-U test was used due to normality violations in the benefits sections. Results in this area suggest that there are no statistically significant differences in perceptions of the benefits of Outdoor Early Intervention for urban participants compared to rural/suburban participants. Similarly, perceptions of the benefits of OEIS for participants whose children received services from a single provider did not differ

significantly from those receiving services from multiple providers. The overall mean for the benefits section was M=3.0, suggesting that family were more likely to agree with many of the statements. This indicates that many families perceived that going outside will support their child's development. There was no violation of normality for the Barriers subscale data, therefore independent samples *t*-tests were conducted to test this hypothesis**.** Based on these findings, the researcher can conclude there is no statistically significant difference in perceived Outdoor EI barriers between the geographical location or number of providers. The overall mean for the barriers section was M=1.4, suggesting that participants did not perceive many barriers impacting their ability to go outside with their child and provider. Next steps for this survey and Outdoor EI will be discussed in the remaining chapter.

Chapter 5: Discussion, Conclusions, and Recommendations

The chapter was organized into five sections. In the first section, COVID-19 impacts are described. In the second section, summary of findings of research questions are described. In the third section, overall conclusions of the data are described. In the fourth section, limitations of the study are described. Finally, future recommendations and implications are reviewed.

Impacts of COVID-19

COVID-19 created many barriers for this dissertation. First, EI providers were prohibited from face-to-face sessions with families. On a case-by-case situation, some families were allotted outdoor services. However, majority of services took place through telehealth. This had a significant impact of the first research question, *what is the current state of Outdoor EI?* Second, all recruitment procedures took place through online platforms. This made it challenging to connect with CCBs and SCs, which may have impacted recruitment procedures. Third, families' perspectives of outdoor spaces in large social gatherings may have been influenced differently because of the speared of the virus. To measure how COVID-19 influenced responses, the researcher added specific

questions. The following paragraph will discuss the influence COVID-19 had on family members in EI.

Six COVID-19 questions were added to the survey to assess the impact on families. Over 67% of families agreed that COVID-19 prevented them from going outside with their provider. Additionally, 48% of families reported that COVID-19 has impacted their own abilities to go outside, whereas 43% of families reported that COVID-19 has not prevented them from going outside. This gap may be attributed to differences in beliefs around COVID-19 and access to outdoor settings. For example, individuals with backyards can easily access outdoor spaces compared to those who live in apartments. When asked, *COVID-19 has made me afraid of going outside with my family*, 63% of families disagreed with this statement and only 28% agreed with this response. The other 9% felt neutral around this question. Overall, children do not appear to be afraid to go outside because of COVID-19, 90% of families disagreed with, *my child is afraid to go outside because of COVID-19*. When asked, *COVID-19 has impacted the way I view going outside*, 58% of families agreed with this statement and only 37% of families disagreed. The other 5% felt neutral.

Based on these finding, it is assumed that COVID-19 influenced the way families responded to many of the questions on the Outdoor Early Intervention Survey (OEIS). This should be taken into consideration when analyzing the data from the OEIS. Also, CCBs may be able to use this data when thinking about transitioning back to in-home and community services. There is a large portion of individuals who feel uncomfortable with COVID-19 and this may cause barriers when transitioning back to these settings.

Summary Findings

The OEIS was developed to comprehensively assess perceived benefits and perceived barriers of Outdoor EI. Item analysis, reliability and correlation, and independent *t*-test were completed to determine reliability of assessments and to measure differences across geographical location and the amount of services provider. The responses from participants were higher than expected based on previous studies receiving very low participation from families. It is believed that family participation was higher for this study because of (1) the researcher's personal outreach to service coordinators (SCs), (2) providing incentives to both SCs and families, and (3) families may have perceived this survey as valuable. Even with continued efforts to get statistical data on child enrollment within EI, this information was not provided. Therefore, a response rate cannot be calculated. It is possible that this data was not provided because of the ever-changing status of children enrolled within the program.

Research Question One

The overall answer to question one, *what is the current state of Outdoor EI*, was unanswered due to the COVID-19 crisis. When this survey was distributed, majority of the families were using telehealth services. Only 66 participants reported going outside with their provider. Of those 66 participants, majority reported services taking place in the backyard (63%) followed by: playgrounds (24%), nature trails (5%), nature centers (3%), gardens (3%), and state parks (2%). Over 94% of families agreed that they like going outside with their provider. Also, 92% of families agreed that the feel confident going outside with their provider. Furthermore, over 93% of families reported that their

child enjoys going outside for EI sessions. Families were also given the option to write comments related to going outside with their provider. Families were extremely positive regarding outdoor time with the provider. Listed are some of the comments families provided: *We've had one session at a park, and my child has made such a huge leap in improvement!!!; We have seen significant improvements since we have started outside sessions, my child loves being outside and seems more receptive to our provider, in addition, the mornings have created a beautiful setting for interaction;* and *Going outside and doing something is the best way to get my daughter motivated and it helps my provider see things from many different angles which in turn helps me and my child.*

Based on the data that was received, it appears that families who have gone outside with their provider have appreciated this experience. Families reported higher level of satisfaction in their parenting skills, motivation from their child, and overall enjoying their experiences outside with their provider. It is important to remember that this survey was sent during COVID-19 which may have skewed the results of this study. During this time, families were only allowed outdoor sessions. It is likely that families appreciated having in-person sessions more than telehealth. It is recommended that this survey is distributed again when COVID-19 restrictions have been released to determine if it is outdoor sessions that families are enjoying or if it was just having in-person sessions.

Research Question Two

Question two, *what are the perceptions of benefits regarding Outdoor EI*, included two sub questions: *what are the perceptions of desirability between rural,*

urban, and suburban areas and *what are the perceptions of desirability between services.* To answer the first sub question about differences across geographical location, the sample was split into two groups: rural/suburban (n = 47) and urban (n = 81). Rural and suburban were combined due to suburban only having seven responses and to create a more even distribution between sample sizes. The overall n for geographical location was 128. To answer the second sub question about differences across child services, the sample was split into two groups: single provider (n = 60) and multiple providers (n = 82). The overall n for service providers is 142. To evaluate hypothesis one and two, the non-parametric Independent Samples Mann-Whitney-U test was used due to normality violations. No statistically significant differences in perceptions of the benefits of Outdoor EI for urban participants (M_{rank} = 64.95) compared to rural/suburban participants (M_{rank} = 63.72) were indicated (U = 1867.00; z = -1.81; *ns;* $r_{Location}$ = -0.16). Similarly, perceptions of the benefits of OEIS for participants whose children received services from a single provider (M_{rank} = 70.83) did not differ significantly from those receiving services from multiple providers (M_{rank} = 71.99) in this sample (U = 2,500.00; z = 1.66; *ns;* $r_{Provider}$ = 0.15). Therefore, the null hypothesis is not rejected for either sub question.

Research Question Three

Question three, *what are the perceptions of barriers regarding Outdoor EI*, included two sub questions: *what are the perceptions of barriers between rural, urban, and suburban areas* and *what are the perceptions of barriers between services.* Similar to question two, the first sub question was split into two groups: rural/suburban (n=47) and urban (n=81). Again, suburban was combined with rural for even disruption for sample

sizes. The overall *n* for geographical location was 128. To answer the second sub question about differences across child services, the sample was split into two groups: single provider ($n = 60$) and multiple providers ($n = 82$). The overall *n* for service providers is 142. There was no violation of normality for the barriers' subscale data, therefore independent samples *t*-tests were conducted to test this hypothesis. Results for geographic location indicated similar perceptions of Outdoor EI benefits by both the rural/suburban group and the urban group ($M_{(rural/suburban)} = 41.80$, $SE_{(rural/suburban)} = 1.228$; $M_{(urban)} = 43.60$, $SE_{(urban)} = 1.233$). Similarly, results for service provider suggested comparable perceptions of EI benefits by both the single provider and the multiple providers group ($M_{(single)} = 44.32$, $SE_{(single)} = 1.44$; $M_{(multiple)} = 41.63$, $SE_{(multiple)} = 0.97$). Therefore, the null hypothesis is not rejected for either sub question.

Overall Conclusions of Data

The current study provided the initial psychometric properties for the OEIS. It was determined that the reliability and validity were supported. However, more research is needed to confirm the findings from this current investigation and to further refine the scale. This measure can assist CCBs in program evaluations by determining the need to support families in outdoor settings. Since this new scale may provide insights into families' perspectives of benefits and barriers of Outdoor EI, this information could be used to enhance EI sessions. Furthermore, with the addition of COVID-19 questions, CCBs can assess families' perspective of the virus and how this may impact integration into outdoor community settings. Such training is needed for providers to collaborate and

engage with families in outdoor setting while still implementing evidence-based interventions to young children and families.

The OEIS can provide CCBs with a breakdown of specific insights that may assist in developing outdoor activities that support IFSP outcomes and family engagement. Furthermore, the OEIS can provide CCBs with a breakdown of specific barriers that prevent families from engaging in outdoor activities with their child and their provider. Collectively, this information can be used to evaluate the needs within their community and provide supports that allow families and children to be involved in more inclusionary settings.

Limitations of the Study

This current study has important limitations that can be grouped into those that pertain to the instrument, the final sample, and to the overall recruitment procedures. Issues related to each of these three general limitation areas will be reviewed with an explanation of how these issues serve to limit the generalizations that can be made.

Instrument Limitations

First, the instrument developed was a self-report measure, which may have caused participants to answer items based on social desirability bias or overestimating their understanding of Outdoor EI concepts. This may have resulted in inflated scores on the benefit and barrier scales. It is possible that the way the items were worded in the benefits section could have influenced positive responses. Additionally, parents may have disagreed with barrier items because of guilt. For example, some parents may have guilt in responding that they are too tired to go outside. Second, the instrument used a rating

scale, which subjective and assumes that the distance between each point is equal (Bond & Fox, 2015). Moreover, participants may be influenced by their previous responses and maintain agreement in their responses regardless of content (DeVellis, 2017). Third, this study did not use focus groups, which have been documented to be valuable in scale development (Fowler, 2014). Adding focus groups to the initial stages of development may have been able to provide insights into their understanding of Outdoor EI and may have helped in the drafting of items. Fifth, this study did not include a pilot sample because of limited access to participants. It was believed that a pilot study would have taken away from the sample size in the overall study. A pilot study may have been able to help with the drafting of items. Sixth, eliminating COVID-19 bias from participants was hard to control. Even with multiple prompts asking participants to think of Outdoor EI away from the context of COVID-19, over 58% of families agreed that COVID-19 has impacted their beliefs on going outside.

Sample Limitations

Overall, there were three issues in regard to the sample used in this study: size, representation, and unequal distribution. First, the sample size was relatively small. A "very good" sample size in most circumstances includes 200 participants or more (DeVellis, 2017). With a larger sample size, higher levels of psychometric properties could have been obtained. Second, all participants were from one state, and results may not be representative of a nationwide sample. Legislation and implementation requirements may differ in other regions, which may impact how respondents endorse

items related to Outdoor EI. Furthermore, even in the state of Colorado, the sample did not accurately reflect the Hispanic population, even with the survey transcribed in Spanish. It is recommended that more personal outreach is conduct with families of different racial and ethnic backgrounds. This is a common barrier within the EI community, CCBs may want to reach out to other community support programs for recruitment of families with different racial and ethnic backgrounds. Third, the unequal distribution and sample size across location and child services signify that the conclusions drawn about the differences between benefits and barriers must be reverified in other studies before broad generalizations can be made about the perspective benefits and barriers of Outdoor EI.

Procedural or Recruitment Limitations

The manner of data collection, which involved emailing the CCBs and using a statewide listserv made it difficult to achieve a response rate. Also, it is likely that some individuals did not have easy access to the internet, making it less likely for them to complete the measure, due to its online distribution method. Furthermore, distributing the survey during a global pandemic may have resulted in fewer responses. For example, many parents were working from home and assisting their children with online learning. All things consider, families may have prioritized online learning and work obligations over completing a survey.

Future Recommendations and Implications

In this next section, both research and current field recommendations are provided. For research, discussions around national distribution and additional surveys are discussed. For the field, potential training opportunities and provider recourses are conversed.

Future Recommendations for Research

National Distribution. While the findings of the current investigation are promising, more empirical support is needed to further validate the OEIS. It is recommended that the OEIS is distributed to EI programs throughout the United States to further validate the scale and determine if the scale is appropriate for nationwide use. By administering the measure to larger groups, the results of the scale would allow for a broader sample in order to make the OEIS generalizable.

This survey should be distributed nationally with the COVID-19 questions because requirements differ by state and may reflect different outcomes. It was reported by more than half of the participants in the state of Colorado that COVID-19 has influenced their perspectives on going outside. Therefore, this could have caused some biases with responses. Additionally, research question one remains unanswered because of COVID-19 prohibiting families from meeting in-person with their provider. This information is crucial in the study because it can inform training gaps. It is also highly recommended that this survey is distributed again when COVID-19 is no longer a concern to see if changes in benefits or barriers occur.

Survey Design. Although, all items had acceptable ranges for reliability and correlation, some refinements to the scale should be consider. First, the COVID-19 questions may want to be removed when this is no longer a concern. Second, responses to question 5 (types of provider support) and 16 (desired types of support) may want to be asked as individual items so that that these responses are analyzed separately. Third, questions 19 (staying focused), 37 (importance of indoor activities), and 51 (child distraction) may want to be removed because of a high percentage of participants responding as neither agree nor disagree. This may imply that these questions are not as important to participants.

Survey for Providers. Based on the results of this survey, families reported wanting to spend time outside with their provider and there are little barriers that are preventing them from going outside. The OEIS data suggests that there is a need to develop an Outdoor EI framework that supports providers and families in outdoor settings. Creating a provider version of the OEIS would be the first step needed towards the development of an Outdoor EI framework. This will allow researchers to understand provider perspectives on benefits and barriers regarding outdoor sessions. There should be a broad range of questions to access comfortability across different professions. For example, researchers can create a skip pattern so that each profession (e.g., speech therapists, physical therapists) has the opportunity to report out on the benefits and barriers of Outdoor EI. Additionally, the OEIS should include items around liability and confidentiality. Based on the profession, there may be higher levels of concerns around provider and family protection in outdoor environments. For example, providers working

on mental health needs may have some challenges with client privacy. Lastly, questions around training topics should be included such as outdoor safety, navigating playgrounds, social play, and creating toys from nature as both the literature review and data from the OEIS suggest that these are areas parents would like assistance with when playing outside with their child. Researchers can use the information from the parent and provider OEIS to create training opportunities that supports providers and families in outdoor environments.

Survey for CCBs. A second step towards the development of an Outdoor EI framework is creating a CCB version of the OEIS. In order for change to happen, this approach needs to have strong administrative support. It is likely that this group may need additional education on Outdoor EI and how this approach will support families. This survey should also include benefits and barriers that are tailored towards legislations and system requirements for EI. Such benefit questions may include promotion of inclusive environments, supporting families in the community, and meeting IFSP goals. Additionally, items that discuss protentional liability, legal obligations, and funding barriers should be added to the CCB OEIS.

CCB's can also complete a program evaluation by using all three surveys. These surveys would allow CCBs to learn more about the types of family supports that are needed in outdoor settings and gaps that are preventing Outdoor EI. Based on this information, programs can create training opportunities for CCBs and providers that will assist potential barriers that are preventing outdoor EI. Furthermore, this type of program evaluation will help determine if EI services are taking place in natural environments

which is federal requirement set by IDEIA (§303.26). Currently, there is insufficient data that supports EI services are taking place in community settings. This information is vital because it promotes inclusion for children with disabilities.

Future Recommendations for the Field

Based on the data from the OEIS, it appears that there is a major training gap. Parents are reporting they want to go outside but very little parents are receiving this type of service. It is assumed that providers are not offering this type of service because of a lack in training. The following subsections will discuss protentional training opportunities that should be considered by EI providers, CCBs, and future researchers.

Training. Researchers should consider building an Outdoor EI framework. Based on the OEIS data and literature review, researchers should consider adding the following sections to the framework: family-center models, expanding environments, and creating toys out of nature. The following subsections will discuss the possible benefits of each category.

Family-Center Models. Numerous providers are reported to still use a medical service-delivery models (Baril, 2018). Providers who use this model deny family involvement. This may imply that providers neglect to support the family in community environments because they do not give families these opportunities. Although the first research question was unanswered due to COVID-19, antidotal information suggests that families are not going outside with their provider. This information is extremely contradicting to the data that was discovered with the OEIS. Families reported a strong desire to go outside, needing support with their child in outdoor settings, and very little

barriers that are preventing them from going outside. This suggest that providers using the medical model are not supporting families' needs. With that said, the foundation of Outdoor EI training should be rooted in family-center models. This training should support providers on how to work directly with families during EI sessions. This may have to start with educational training in graduate programs. Some graduate programs and supervised clinical experiences may be training providers in a medical model. Graduate programs and supervised clinical experiences would benefit from an interdisciplinary style to promote family-center models and working in team-based settings. Graduate programs should also provide additional training in parent coaching models.

Systems Training. It is likely that outdoor services are not provided because of the lack of knowledge within this area. A global training should be conducted for the CCBs, SCs, and providers. This training should begin by revisioning natural environments to literally mean "nature environments." This training should pull in developmental outcome data on children who spend time outdoors. Based on the literature within this dissertation, it is believed that Outdoor EI can support all five developmental domains while encouraging children to be curious and explorative of their environments. Secondly, being outside has also supported parents with self-efficacy, social support, and mental health. Based on this information, Outdoor EI has the protentional to support healthy child developmental skills while using family-center models.

This training should also provide SCs and providers with knowledge on how to write Individualized Family Service Plan (IFSP) goals that support the child and family in everyday "natural" environments. By developing Outdoor specific IFSP goals, EI can assess outcome data. According to Lucas, Gillaspy, Peters, & Hurth (2014), IFSP goals should be necessary and functional for the family, reflect real-life contextualized settings, integrate developmental domains and is disciple-free, jargon-free, written in positive language, and use active words rather than passive words. These goals should also include family interests and values. An example of an IFSP goal using components of Outdoor EI may include, "Lily will go fishing with her family and hold her own fishing pole (Lucas, Gillaspy, Peters, & Hurth, 2014. p.7)." To begin the awareness of outdoor EI, an infographic will be created based on the data from this dissertation and be presented to CCBs.

Expanding Environments with Community Partnerships. Currently, EI is primarily taking place in home and center-based settings (NEILS, 2007). However, based on the OEIS, families would like additional support at parks, playgrounds, and other outdoor based settings. Providers need to consider out-of-the box strategies by expanding services in these environments. Services in outdoor settings can support children and families in the following areas: expanding child developmental skills in a variety of settings, lowering mental health concerns, building family connections, enhancing social skills, and encouraging curiosity (Deci & Ryan, 2012; Cordiano et al., 2019; Bratman et al. 2015; Ernst & Burcak 2019).

Part of the Outdoor EI framework should involve community connections to local outdoor programs. Community gardens are a great resource that providers can utilize with families. Many schools across the country have started school gardens because of the strong social, academical, and vocational skills they provide. Families and children from EI can still benefit from these services. For example, children can work with an occupational therapist on sensory integration or a speech therapist to label objects. Families may also benefit from community gardens because research has suggested that community gardens enhance connections with others (Poulsen et al., 2014). As described in a previous chapter, families who have a child with a disability are at increased risks of social isolation (National Counsel on Disability, 2010). Community gardens may help families build social support while also teaching numerous child developmental skills. In the state of Colorado, there are many unique programs such as the Denver Urban Gardens that connect communities and schools to vast garden opportunities. EI providers and CCBs should work with these organization to promote these opportunities to families in EI. Additionally, CCBs can connect with schools that already have gardens in place. This may assist in the transition between EI and schools. For example, the child, provider, family, and new teacher can meet at the garden and build a connection in a neutral, fun, and relaxing place.

CCBs and provider should also work with local community groups to advocate for inclusive playgrounds and other outdoor recreational areas. As discussed in a previous chapter, toddlers with disabilities are prevented from playing with their same age peers on the playground because of physical disabilities, overwhelming sensory experiences,

and/ or social development delays (Parkes, McCullough, & Madden, 2010; Edimiston, Merkle, & Corbett 2015; Stanton-Chapman Schmidt, in press). The OEIS provided similar data and parents voiced wanting support in outdoor settings. Although, inclusive playgrounds are costly to build, there are many grant opportunities that can assist in this area. For example, the Great Outdoors Colorado (GOCO) Board awarded $5,750,000 in grants to 31 projects across Colorado, such as the Local Park and Outdoor Recreation (LPOR) program, School Yard Initiative (SYI) program, and Schools and Outdoor Learning Environments (SOLE) program (GOCO, 2020). CCBs and providers can apply for these same types of grants that promote outdoor play and learning for toddlers. Providers and CCBs can partner with these agencies to develop toddler friendly outdoor environments that promote inclusion for children with disabilities. This is particularly important to think about for families in rural areas. Inclusive playgrounds may be even harder for families in rural area to access. It is crucial that these families are provided with the same resources. It is highly recommended that CCBs in rural areas work with these programs to increase resources within their community.

Making Toys Out of Nature. Many researchers have provided evidence that children use and manipulate natural and manmade items within their environments without the need for commercial toys (Brown 2012; Nwokah & Gulker 2006; Nwokah & Ikekeonwu 1998, 2007). Training providers on how they can make toys out of nature may help promote the "bagless" approach that was discussed in a previous chapter. By using this approach, providers can teach families how to make toys out of easily accessible materials. Not only does this put less pressure on parents to buy expensive toys, White

and Stoecklin (2008) indicate that natural elements are open-ended materials that can enhance imagination, creativity, and problem solving. Furthermore, using toys out of natural environments, may promote playtime that does not involve technology. Additionally, this may be able to support families in rural areas who struggle to access new toys.

Providers may have hesitation with this approach because homemade toys are not always included in evidence-based practices. However, some researchers are investigating this type of substitution and demonstrating promising results. Swank et al., (2014) created a Nature-Based Child-Centered Play Therapy Design (NBCCPT). Researchers implemented an A-B-A single case research design to examine the treatment of NBCCPT with four participants that were in early elementary school. The foundations of Child-Centered Play Therapy (CCPT) stayed the same, but the guidelines for the playroom and the selection of toys differed. The play area took place in a natural environment and the toys were from natural martials. The children in this study demonstrated fewer behavioral problems and increased on-task behavior. Additionally, these children maintain improved behavior postintervention. Other researchers should consider this type of substitution with evidence-based practices and this type of research should be expanded across professions (e.g., speech therapy, occupational therapy, physical therapy). Providers should be given additional training on how these substitutions can be accomplished.

Telehealth. One thing to consider is that COVID-19 restrictions may be present for some time. Since COVID-19, family stress and mental health needs have increased. In

a survey conducted by Russel, Hutchison, Tambling, Tomkunas, & Horton (2020), over 400 parents completed a measure that assessed COVID-19 stress, parent mental health concerns and parent child relationships. Their survey indicated higher levels of parent stress because of COVID-19, increased diagnoses of anxiety and depression with parents, and strains on parent-child relationships. Lopes, Muñana, and Hamel (2020), also conducted a survey that reported 69% of mothers with a child between the ages of five to 17 have experienced an adverse health effect because of stress and worry over COVID-19. The current studies indicate the need to support families during this trying time. As mentioned in earlier chapters, spending time outside can lower stress and mental health concerns. Outdoor time may be more imperative than ever. Outdoor time is a great way for families to get out of the house while still using precautions related to COVID-19. Based on the results of this survey, families demonstrated a strong desire to go outside despite COVID-19. EI providers may have to develop creative approaches towards helping families outside while using telehealth. Even though services are happening through telehealth, it is still possible to have outdoor sessions. Providers can ask parents to set up the video device in the background and the provider can coach the family though various activities. Providers can also "prescribe" outdoor time. One example may include a mindfulness scavenger hunt. Providers can put pictures together (e.g., flower, cloud, tree) and ask the family to find these items. After finding the item, the family should take some time to explore the item (e.g., smelling, touching). These are easy and free activities that can engage the whole family while also still working on child development. However, more training and research is needed in this area.

Conclusion

In conclusion, families showed a desire for Outdoor EI. Surprisingly, majority of the respondents disagreed with the barriers of Outdoor EI. This may imply that Outdoor EI will be highly accepted among families in EI. Families also reported having a strong belief in outdoor play with their child. This information demonstrates a need for continuous investigation in Outdoor EI. It is recommended that this survey is distributed again at the national level and during a time when COVID-19 restrictions have been lifted. Furthermore, a survey should be created for providers and CCBs that measures comfortability in providing outdoor interventions, training needs, and legal requirements. Once more information is gathered, researchers can develop an Outdoor EI training model to support providers and families. This new measure is an important and needed addition to the literature on EI. By providing additional support in outdoor settings, families who have a child with a disability can learn important skills that assist their child in inclusive settings.

References

Allen, M. (2017). *The SAGE encyclopedia of communication research methods*. SAGE Publications.

American Academy of Pediatrics. (2016, October). American academy of pediatrics announces new recommendations for children's media use. *Advocacy & Policy*. https://www.aap.org/en-us/about-the-aap/aap-press-room/Pages/American Academy-of-Pediatrics-Announces-New-Recommendations-for-Childrens Media Use.aspx

Baril, E. (2018). *Perceptions of caregiver coaching and factors That influence implementation: A mixed methods case study of New Hampshire's Part C early intervention* (Publication No. 10813108) [Doctoral Dissertation University of New Hampshire]. ProQuest Dissertations and Theses Global.

Barkow, J. H., Cosmides, L., & Tooby, J. (1992). *The adapted mind: Evolutionary psychology and the generation of culture.* Oxford University Press.

Batshaw, M. (2002). *Children with Disabilities* (5th ed.). Brookes Publishing Company.

Bilton, H. (2010). *Outdoor learning in the early years: Management and innovation*. Routledge.

Bronfenbrenner, U. (1979). *The ecology of human development*. Harvard university press.

Brown, F. (2012). The Play Behaviors of Roma Children in Transylvania. *International Journal of Play,* 1(1) 64–74. https://doi.org/10.1080/21594937.2012.658165

Bratman, G. N., Hamilton, J. P., Hahn, K. S., Daily, G. C., & Gross, J. J. (2015). Nature experience reduces rumination and subgenual prefrontal cortex activation. *Proceedings of the National Academy of Sciences*, *112*(28), 8567-8572. https://doi.org/10.1073/pnas.1510459112

Bond, T.G., & Fox, C.M. (2015). *Applying the Rasch model: Fundamental measurement in the human sciences* (3rd ed.). New York: Routledge.

Camilli, G., Vargas, S., Ryan, S., & Barnett, W. S. (2010). Meta-analysis of the effects of early education interventions on cognitive and social development. *Teachers College Record*, *112*(3), 579-620. https://eric.ed.gov/?id=EJ888457

Catalino, T., & Meyer, L. E. (2016). Environment: Promoting meaningful access participation, and inclusion (DEC Recommended Practices Monograph Series No. 2). *Division for Early Childhood*.

Centers for Disease Control and Prevention. (2017a, March). *How we can help children in rural communities thrive*. https://blogs.cdc.gov/publichealthmatters/2017/03/childrenin-rural-communities/

Centers for Disease Control and Prevention. (2017b, November). *Estimated prevalence of children with diagnosed developmental disabilities in the United States, 2014 2016*. https://www.cdc.gov/nchs/products/databriefs/db291.htm

Centers for Disease Control and Prevention. (2018, January). *Mental health: Data and publications*. https://www.cdc.gov/ncbddd/disabilityandsafety/child-safety.html

Centers for Disease Control and Prevention. (2019, September). *Safety and children with disabilities*. https://www.cdc.gov/ncbddd/disabilityandsafety/child-safety.html

Clements, R. (2004). An investigation of the status of outdoor play. *Contemporary Issues in Early Childhood*, *5*(1), 68-80. https://doi.org/10.2304%2Fciec.2004.5.1.10

Cohen, S. D. (2017). Three Principles to improve outcomes for children and families. science to policy and practice. *Center on the Developing Child at Harvard University*. https://developingchild.harvard.edu/resources/three-early-childhood development-principles-improve-child-family-outcomes/

Cole, B., Pickard, K., & Stredler-Brown, A. (2019). Report on the use of telehealth in early intervention in Colorado: Strengths and challenges with telehealth as a service delivery method. *International Journal of Telerehabilitation*, *11*(1), 33. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6597149/

Coley, R. L., Leventhal, T., Lynch, A. D., & Kull, M. (2013). Relations between housing characteristics and the well-being of low-income children and adolescents. *Developmental Psychology*, *49*(9), 1775. https://www.ncbi.nlm. nih.gov/pmc/articles/PMC6597149/

Colorado County Designation. (2019). *List of the counties in Colorado and their designations.* https://colorado.gov/pacific/sites/default/files/DC_STI_HIVPrev_ oloradCounty-Designations.pdf

Colorado Department of Education. (2018, February). *Colorado Education Facts and Figures.* https://www.cde.state.co.us/communications/coeducationfactsandfigures

Colorado Rural Health Center. (2016). *Colorado: county designations*. https://www.colorado.gov/pacific/sites/default/files/PCO_CHSC_CountyDesigna ions_2016.pdf

Comrey, A. L., & Lee, H. B. (2013). *A first course in factor analysis*. Psychology Press.

Cordiano, T.S., Lee, A., Wilt, J., Elszasz, A., Damour, L.K., Russ, S.W., (2019). Nature based education and kindergarten readiness: Nature-based and traditional preschoolers are equally prepared for kindergarten. *International Journal of Early Childhood Environmental Education, 6*(3), 18-36. https://files.eric.ed.gov/fulltext/EJ1225659.pdf

Cowen, E. L., Pedro□Carroll, J. L., & Alpert□Gillis, L. J. (1990). Relationships between support and adjustment among children of divorce. *Journal of Child Psychology and psychiatry*, *31*(5), 727-735. https://www.ncbi.nlm.nih.gov/pubmed/2398117

Crawford, M. J., & Weber, B. (2014). *Early intervention every day: Embedding activities in daily routines for young children and their families*. Brookes Publishing Company.

Darcy, S., & Dowse, L. (2013). In search of a level playing field–the constraints and benefits of sport participation for people with intellectual disability. *Disability & Society*, *28*(3), 393-407. https://doi.org/10.1080/09687599.2012.714258

Deci, E. L., & Ryan, R. M. (2012). Self-determination theory. *Handbook of Theories of Social Psychology* (p. 416–436). Sage Publications Ltd. https://doi.org/10.4135/9781446249215.n21 https://doi.org/10.4135/9781446249215.n21

DeVellis, R.F. (2017). *Scale development: Theory and applications (4th ed.).* Thousand Sage Publications, Inc.

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2009). Internet, mail, and mixed-mode surveys the tailored design method. Wiley.

Division for Early Childhood. (2009). *Early childhood inclusion: A summary.* https://www.naeyc.org/sites/default/files/globallyshared/downloads/PDFs/resources/position-statements/DEC_NAEYC_ECSummary_A.pdf

Division for Early Childhood. (2014). *DEC recommended practices in early intervention/early childhood special education 2014*. http://www.dec-sped.org/recommendedpractices

Division for Early Childhood. (2015). *DEC recommended practices glossary.* http://www.dec-sped.org/recommendedpractice

Dubow, E. F., Boxer, P., & Huesmann, L. R. (2009). Long-term effects of parents' education on children's educational and occupational success: Mediation by family interactions, child aggression, and teenage aspirations. *Merrill-Palmer Quarterly, 55*(3), 224. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2853053/

Duch, H., Fisher, E. M., Ensari, I., Font, M., Harrington, A., Taromino, C., & Rodriguez, C. (2013). Association of screen time use and language development in Hispanic toddlers: a cross-sectional and longitudinal study. *Clinical Pediatrics*, *52*(9), 857-865. https://doi.org/10.1177%2F0009922813492881

Dunst, C. J., & Trivette, C. M. (2009). Using research evidence to inform and evaluate early childhood intervention practices. *Topics in Early Childhood Special Education, 29*(1), 40–52. https://doi.org/10.1177/0271121408329227

Dunst, C. J., Bruder, M. B., & Espe-Sherwindt, M. (2014). Family capacity-building in early childhood intervention: Do context and setting matter?. *School Community Journal*, *24*(1), 37-48. https://eric.ed.gov/?id=EJ1032240

Durairaj, A. (2019). Perspective parents of special-needs kids assume they're less desirable employees: They're wrong. *Washington Post.* https://www.washingtonpost.com/lifestyle/2019/01/08/parents-special-needs-kidsassume-theyre less-desirable-employees-theyre-wrong/

Edmiston, E. K., Merkle, K., & Corbett, B. A. (2015). Neural and cortisol responses during play with human and computer partners in children with autism. *Social Cognitive and Affective Neuroscience*, *10*(8), 1074-1083. https://www.ncbi.nlm.nih.gov/pubmed/25552572

Early Intervention Colorado. (n.d.). *Find your local community center board.* Retrieved Februay 18, 2020 from http://coloradoofficeofearlychildhood.force.com/eicolorado/EI_CCB?lang=en

Ekas, N. V., Lickenbrock, D. M., & Whitman, T. L. (2010). Optimism, social support, and well-being in mothers of children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *40*(10), 1274-1284. https://www.ncbi.nlm.nih.gov/pubmed/20195734

Elkind, D. (1967). Piaget and montessori. *Harvard Educational Review*, *37*(4), 535 545. https://doi.org/10.17763/haer.37.4.n60v725054564376

Gallagher, S., & Hannigan, A. (2014). Depression and chronic health conditions in parents of children with and without developmental disabilities: The growing up in Ireland cohort study. *Research in Developmental Disabilities*, *35*(2), 448-454. https://www.ncbi.nlm.nih.gov/pubmed/24361813

Ernst, J., Burcak, F., (2019). Young children's contributions to sustainability: The influence of nature play on curiosity, executive function skills, creative thinking, and resilience. *Sustainability, 11*(15). https://doi.org/10.3390/su11154212

Estell, D. B., Farmer, T. W., Irvin, M. J., Crowther, A., Akos, P., & Boudah, D. J. (2009). Students with exceptionalities and the peer group context of bullying and victimization in late elementary school. *Journal of Child and Family Studies*, *18*(2), 136-150. https://link.springer.com/article/10.1007/s10826-008 9214-1

Forry, N., Bromer, J., Chrisler, A., Rothenberg, L., Simkin, S., & Daneri, P. (2012). *Family provider relationship quality: Review of conceptual and empirical literature of family provider relationships* (Vol. 46). OPRE report.

Floyd J. Fowler, Jr. (2014). *Survey research methods, 5th Ed*. Sage Publications.

Goode, Howard (2016). Solving the rural area therapy shortage. *Global Therapy*. https://globaltelетherapy.com/solving-rural-area-therapyshortage/

Great Outdoors Colorado. (2020, March). *GOCO board awards 5.75M for parks, outdoor recreation facilities, school playgrounds across Colorado.* https://www.goco.org/ new s/goco-board-awards-575m-parks-outdoor-recreation-facilities-school playgrounds-across-colorado

Guralnick, M. J. (2001). A developmental systems model for early intervention. *Infants and Young Children*, *14*(2), 1-18. http://depts.washington.edu/chdd/ guralnick/pdfs/dev_sys_model_EI_IYC_10_01.pdf

Guralnick, M. J. (2008). International perspectives on early intervention: A search for common ground. *Journal of Early Intervention*, *30*(2), 90-101. https://doi.org/10.1177%2F1053815107313483

Haaland, M. (2019, October). Parents only spend 24 more minutes with their kids than their phones. *New York Post*. https://nypost.com/2019/10/21/parents-only spend24-moreminutes-with-their-kids-than-their-phones/

Hebbeler, K., Spiker, D., Bailey, D., Scarborough, A., Mallik, S., Simeonsson, R., Singer, M., & Linstead, E., Dixon, D. R., Hong, E., Burns, C. O., French, R., Novack, M. N., & Granpeesheh, D. (2017). An evaluation of the effects of intensity and duration on outcomes across treatment domains for children with autism spectrum disorder. *Translational Psychiatry*, *7*(9), e1234. https://www.nature.com/artic les/tp2017207

Heinicke, C. M., Goorsky, M., Levine, M., Ponce, V., Ruth, G., Silverman, M., & Sotelo, C. (2006). Pre□and postnatal antecedents of a home□visiting intervention and family developmental outcome. *Infant Mental Health Journal*, *27*(1), 91-119. https://onlinelibrary.wiley.com/doi/abs/10.1002/imhj.20082 Individuals with

Hiniker, A., Suh, H., Cao, S., & Kientz, J. A. (2016, May). Screen time tantrums: how families manage screen media experiences for toddlers and preschoolers. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems* (pp. 648-660). https://dl.acm.org/doi/abs/10.1145/2858036.2858278

Individuals with Disabilities Education Act of 2004, Pub. L. No. 108-446 U.S.C § 300.111 et seq. (2004).

Individuals with Disabilities Education Act of 2004, Pub. L. No. 108-446 U.S.C § 303.5 et seq. (2004).

Johnson, B., & Christensen, L.B. (2017). *Educational research: quantitative, qualitative, and mixed approaches (8th ed.).* Sage.

Kahn, P., & Kellert, S. (2002). *Children and nature: Psychological, sociocultural, and evolutionary investigations.* MIT Press.

Kalish, M., Banco, L., Burke, G., & Lapidus, G. (2010). Outdoor play: A survey of parent's perceptions of their child's safety. *Journal of Trauma and Acute Care Surgery*, *69*(4), S218-S222.

Keilty, B. (2010). *The early intervention guidebook for families and professionals: Partnering for success.* Teachers College Press.

Keniger, L., Gaston, K., Irvine, K., & Fuller, R. (2013). What are the benefits of interacting with nature? *International Journal of Environmental Research and Public Health*, *10*(3), 913 935. https://www.mdpi.com/1660-4601/10/3/913

Kimbro, R., Brooks-Gunn, J., & Mclanahan, S. (2011). Young children in urban areas: Links among neighborhood characteristics, weight status, outdoor play, and television watching. *Social Science & Medicine, 72*(5), 668-676. https://www.ncbi.nlm.nih.gov/pubmed/20938312

Kline, P. (1979). *Psychometrics and psychology*. Academic Press.

Kloomok, S., & Cosden, M. (1994). Self-concept in children with learning disabilities: The relationship between global self-concept, academic “discounting,”

nonacademic self-concept, and perceived social support. *Learning Disability Quarterly, 17*(2), 140-153. https://doi.org/10.2307%2F1511183

Korfmacher, J., Green, B., Staerkel, F., Peterson, C., Cook, G., Roggman, L., Schiffman, A. (2008). Parent involvement in early childhood home visiting. *Child & Youth Care Forum, 37*(4), 171-196. https://link.springer.com/article/10.1007/s10566008-9057-3

Lee, H., Tamminen, K., Clark, A., Slater, L., Spence, J., & Holt, N. (2015). A meta-study of qualitative research examining determinants of children's independent active free play. *The International Journal of Behavioral Nutrition and Physical Activity, 12*(1), 5. https://doi.org/10.1186/s12966-015-0165-9

Lines, C., Miller, G., & Arthur-Stanley, A. (2012). *The power of family-school partnering (FSP): A practical guide for school mental health professionals and educators*. Routledge.

Livingston, S. A. (2006). Item analysis. *Handbook of Test Development*, 421-441.

Lopes, L., Muñana, C., & Hamel, L. (2020). It's back-to-school amid COVID-19, and mothers especially are feeling the strain. *Kaiser Family Foundation.* https://www.kff.org/policy-watch/its-back-to-school-amid-covid-19-and-mothers especially-are-feeling-the-strain/

Louv, R. (2008). *Last child in the woods: Saving our children from nature-deficit disorder*. Algonquin Books.

Lucas, A., Gillaspy, K., Peters, M. L., & Hurth, J. (2014). Enhancing Recognition of High Quality, Functional IFSP Outcomes: A Training Activity for Infant and Toddler Service Providers. *Early Childhood Technical Assistance Center*.

Madigan, S., Browne, D., Racine, N., Mori, C., & Tough, S. (2019). Association between screen time and children's performance on a developmental screening test. *JAMA Pediatrics*, *173*(3), 244-250. https://www.ncbi.nlm.nih.gov/pubmed/30688984

Malecki, C. & Demary, M. (2002). Measuring perceived social support: Development of the child and adolescent social support scale. *Psychology in the Schools, 39*(1), 1 8. https://psycnet.apa.org/doi/10.1002/pits.10004

Malik, R., Hamm, K., Schochet, L., Novoa, C., Workman, S., & Jessen-Howard, S. (2018). America's childcare deserts in 2018. *Center for American Progress*. https://www.americanprogress.org/issues/early-childhood/repo rts/2018/12/06/461643/americas-child-care-deserts-2018/

Maller, C. J. (2009). Promoting children's mental, emotional and social health through contact with nature: a model. *Health Education*, *109*(6), 522-543. https://doi.org/10.1108/09654280911001185

Manning, R. E. (2010). *Studies in outdoor recreation: Search and research for satisfaction*. Oregon State University Press.

Matz C., Stieb M., & Brion, O. (2015). Urban-rural differences in daily time-activity patterns, occupational activity and housing characteristics. *Environmental Health*, *14*(1), 88. https://www.ncbi.nlm.nih.gov/pubmed/26566986

Minnesota Association for the Education of Young Children and the Minnesota Professional Development Council. (2004). Minnesota core competencies, first edition. *MnAEY*. https://cdn.ymaws.com/mnaeyc-mnsaca.org/resourc e/resmgr/2018_Conf/minnesotas_knowledge_and_com.pdf

Nabhan, G. P., & Trimble, S. (1994). *The geography of childhood: Why children need wild places*. Beacon Press.

National Council on Disability. (2010). Rocking the cradle: Ensuring the rights of parents with disabilities and their children. *ERIC Clearinghouse.* https://web.archive.org/web/20150324073927/http://www.ncd.gov/publications/ 012/Se 272012/Endnotes/publications/2012/Sep272012/Ch13#end989

Neilsen. (2009, May). Americans watching more TV than ever: Web and mobile video up too. *Nielsen Wire.* http://blog.nielsen.com/nielsenwire/online_mobile/americans watch ing-more-tv thanever

Nelson, L. (2007). Early intervention for infants and toddlers and their families: Participants, services, and outcomes. Final report of the National Early Intervention Longitudinal Study (NEILS). *SRI International*. http://www.sri .com/neils

Nwokah, E. E., & Ikekeonwu, C. (1998). A sociocultural comparison of Nigerian and American children's games. *Play and Culture, (1)* 59-76.

Nwokah, E., & Gulker, H. (2006). Emergent literacy for children with disabilities: developing positive interest in literacy experiences (Part I). *ACEI: Focus on Infants and Toddlers*, (*18*) 4-8.

Owens, R. E. (2008). *Language development: An introduction* (7th ed.). Pearson Education, Inc.

Parkes, J., McCullough, N., & Madden, A. (2010). To what extent do children with cerebral palsy participate in everyday life situations. *Health & SocialCare in the Community*, *18*(3), 304-315. https://www.ncbi.nlm.nih.gov/pubmed/20201974

Parsons, Ashley. (2011). *Young children and nature: outdoor play and development, experiences fostering environmental consciousness, and the implications on playground design* (Publication No. 19506) [Doctoral dissertation, Virginia Tech]. ProQuest Dissertation and Thesis Global.

Pieker, S., Nelson, D., Deklyen, M., & Staerkel, F. (2005). Enhancing early attachment in the context of early head start: can programs emphasizing family support improve rates of secure infant-mother attachment in low-income families. *Research, Intervention and Policy.* 250-275. https://psycnet.apa.org/record/2005 08750-011

Poulsen, M. N., Hulland, K. R., Gulas, C. A., Pham, H., Dalglish, S. L., Wilkinson, R. K., & Winch, P. J. (2014). Growing an urban oasis: A qualitative study of the received benefits of community gardening in Baltimore, Maryland. *Culture, Agriculture, Food and Environment*, *36*(2), 69-82. https://anthrosource.onlin elibrary.wiley.com/doi/abs/10.1111/cuag.12035

Price, A., (2019). Using outdoor learning to augment social and emotional learning (SEL) skills in young people with social, emotional, and behavioral difficulties. *Journal of Adventure Education and Outdoor Learning, 19*(4), 315-328.

https://www.researchgate.net/publication/269288668_Growing_an_Urban_Oasi A_Qualitative_Study_of_the_Perceived_Benefits_of_Community_Gardening_i Baltimore_Maryland

Raver, S., & Childress, D. (2014). *Family-centered early intervention: Supporting infants and toddlers in natural environments.* Paul H. Brookes Publishing Co.

Revell, S., Duncan, E., & Cooper, M. (2014). Helpful aspects of outdoor therapy experiences: An online preliminary investigation. *Counselling and Psychotherapy Research, 14*(4), 281-287. https://www.tandfonline.com/doi/abs/10.1080/14733145.2013.818159

Rideout, J., Vandewater, A., & Wartella, A. (2003). *Zero to six: Electronicmedia in the lives of infants, toddlers and preschoolers.* Kaiser Family Foundation.

Rogers, S., Estes, Lord, Vismara, Winter, Fitzpatrick, Dawson. (2012). Effects of a brief early start Denver model (ESDM)–Based parent intervention on toddlers at risk forautism spectrum disorders: A randomized controlled trial. *Journal of the American Academy of Child & Adolescent Psychiatry, 51*(10), 1052-1065. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3487718/

Rowan, C. (2010). Unplug don't drug: A critical look at the influence of technology on child behavior with an alternative way of responding other than evaluation and drugging. *Ethical Human Psychology and Psychiatry*, *12*(1), 60-68. https://connect.springerpub.com/content/sgrehpp/12/1/60

Russell, B. S., Hutchison, M., Tambling, R., Tomkunas, A. J., & Horton, A. L. (2020). Initial challenges of caregiving during COVID-19: caregiver burden, mental

health, and the parent–child relationship. *Child Psychiatry & Human Development*, *51*(5), 671-682. https://doi.org/10.1007/s10578-020-01037-x

Salovey, P., Rothman, A., Detweiler, J., & Steward, W. (2000). Emotional states and physical health. *American Psychologist, 55*(1). https://www.ncbi.nlm.nih.gov/pubmed/11392855

Sandifer, P. A., Sutton-Grier, A. E., & Ward, B. P. (2015). Exploring connections among nature, biodiversity, ecosystem services, and human health and well-being: Opportunities to enhance health and biodiversity conservation. *Ecosystem Services*, (*12*) 1-15. https://doi.org/10.1016/j.ecoser.2014.12.007

Shields, N., & Synnot, A. (2016). Perceived barriers and facilitators to participation in physical activity for children with disability: a qualitative study. *BMC Pediatrics, 16*(1), 9. https://www.ncbi.nlm.nih.gov/pubmed/11392870

Smith, L. E., Hong, J., Seltzer, M. M., Greenberg, J. S., Almeida, D. M., & Bishop, S. L. (2010). Daily experiences among mothers of adolescents and adults with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *40*(2), 167 178. https://www.ncbi.nlm.nih.gov/pubmed/19655239

Stanton-Chapman, T. L., & Schmidt, E. L. (in press-a). An examination of family needs for a family inclusive recreational facility for children with and without disabilities. *Intellectual and Developmental Disabilities*.

Strain, P. S., & Bovey, E. H. (2011). Randomized, controlled trial of the LEAP model of early intervention for young children with autism spectrum disorders. *Topics in*

Early Childhood Special Education, *31*(3), 133-154. https://journals.sagepub .com/doi/abs/10.1177/0271121411408740

Sukel, K. (2019). Dealing with the shortage of rural physicians. *Medical Economics, 96*(17), 18-22. https://www.medicaleconomics.com/news/dealing-shortage-rural physicians

Swank, J. M., Shin, S. M., Cabrita, C., Cheung, C., & Rivers, B. (2015). Initial investigation of nature□based, child□centered play therapy: A single□case design. *Journal of Counseling & Development*. https://doi.org/10.1002/jcad.12042

Szczytko, R., Carrier, S.J., Stevenson, K.T., (2018). Impacts of outdoor environmental education on teacher reports of attention, behavior, and learning outcomes for students with emotional, cognitive, and behavioral disabilities. *Frontiers in Psychology, 3*(46). https://doi.org/10.3389/feduc.2018.00046

Tomfohrde, O., & Reinke, J. (2016). Breastfeeding mothers' use of technology while breastfeeding. *Computers in Human Behavior, 64*, 556-561. https://doi.org/10.1016/j.chb.2016.07.057

Tovey, H. (2007). *Playing outdoors: Spaces and places, risk and challenge*. McGraw Hill Education.

Troseth, G. L., Saylor, M. M., & Archer, A. H. (2006). Young children's use of video as a source of socially relevant information. *Child Development*, *77*(3), 786-799. https://www.ncbi.nlm.nih.gov/pubmed/16686801

Twenge, J. M., & Campbell, W. K. (2018). Associations between screen time and lower psychological well-being among children and adolescents: Evidence from a

population-based study. *Preventive Medicine Reports*, *12*, 271-283. https://www.ncbi.nlm.nih.gov/pubmed/30406005

US Census Bureau. (2010). *2010 census urban and rural classification and urban area criteria.* https://www.census.gov/programs-surveys/geography/guidance/geo areas/urban-rural/2010-urban-rural.html

Vogt, D. S., King, D. W., & King, L. A. (2004). Focus groups in psychological assessment: enhancing content validity by consulting members of the target population. *Psychological Assessment, 16*(3), 231-243. https://www.ncbi.nlm.ni h.gov/pubmed/15456379

Von Benzon, N. (2011). Who's afraid of the big bad woods? Fear and learning-disabled children's access to local nature. *Local Environment, 16*(10), 1021-1040. https://www.tandfonline.com/doi/abs/10.1080/13549839.2011.636419

Willis, G. B., & Lessler, J. T. (1999). Question appraisal system QAS-99. *National Cancer Institute.* https://www.researchgate.net/profile/Gordon_Willis/publication/ 267938670_Question_Appraisal_System_QAS99_By/links/54b7b26a0cf2e68eb 803f6a.pdf

Webster-Stratton, C., & Reid, M. J. (2004). Strengthening social and emotional competence in young children: The foundation for early school readiness and success: Incredible years classroom social skills and problem-solving curriculum. *Infants & Young Children*, *17*(2), 96-113. https://journals.lww.com /iycjournal/Fulltext/2004/04000/Strengthening_Social_and_Emotional_Compete ce_in.2.aspx

Weeland, J., Moens, M., Beute, F., Assink, M., Staaks, J., Overbeek, G. (2019). A dose of nature: Two three-level meta-analyses of the beneficial effects of exposure to nature on children's self-regulation. *Journal of Environmental Psychology*, 65.

Weinstein, N., Balmford, A., DeHaan, C. R., Gladwell, V., Bradbury, R. B., Amano, T. (2015). Seeing community for the trees: The links among contact with natural environments, community cohesion, and crime. *BioScience, 65*(12), 1141-1153. https://doi.org/10.1093/biosci/biv151

White, R. (2004). Young children's relationship with nature: Its importance to children's development & the earth's future. *White Hutchinson Leisure & Learning Group*, 1-9. http://www.childrennatureandyou.org/Young%20Children's%20Relationship%20with%20Nature-%20White.pdf

White, R., & Stoecklin, V. L. (2008). Nurturing children's biophilia: Developmentally appropriate environmental education for young children. *Collage: Resources for Early Childhood Educators*, 1-11. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.453.5868&rep=rep1&type=pdf

Williams, C. S., & Ostrosky, M. M. (2019). What about my toys? Common questions about using a bagless approach in Early Intervention. *Young Exceptional Children*. https://doi.org/10.1177%2F1096250619829739

Wilson, E. O. (1993). Biophilia and the conservation ethic. The biophilia hypothesis. *Island Press,* 31-41.

Wright, B., & Panchapakesan, N. (1969). A procedure for sample-free item analysis. *Educational and Psychological measurement*, *29*(1), 23-48.

Appendix A: EI Director Introduction Email and Recruitment Flyers

Dear (EI Director),

My name is Tiffany Lee and I am a Ph.D. candidate from the Child, Family, and School Psychology program at the University of Denver. I am writing you to see if you would be willing to participate in an upcoming study. I have created a survey to see how EI families and providers are using the outdoors for their sessions. My survey is directed towards families enrolled in EI. The areas I am focusing on include, what is currently happening with outdoor interventions, what are the perceived benefits from parents regarding going outside with their child, and what are the perceived barriers from parents that prevent them from going outside. My hope is that with this information, an outdoor EI framework can be created to help providers support parents outside based on their area of need.

I was wondering if you would be willing to have your service coordinators email families a flyer with a link to the survey. Also, would you be willing to have your service coordinators share how many families they send the survey out too? I am offering incentives to both service coordinators and families. For service coordinators, every time the survey is sent out to 10 families, there name will be entered into a drawing for a $100 gift card to either Walmart, King Soopers, Safeway or Amazon. For families who complete the survey, they will also be entered into a drawing for a $100 gift card to either Walmart, King Soopers, Safeway or Amazon.

I plan to have this survey available for both English and Spanish speaking families. The survey is estimated to take about 10 minutes. I am more than happy to discuss this survey in more detail. Is this something you would be interested in? If so, do you have an IRB process?

I look forward to hearing from you. I hope that this survey will help future families with interventions that can help them in their everyday routines.

Sincerely,

Tiffany Lee, MA
Doctoral Student
Child, Family, and School Psychology
University of Denver
Tiffany.reiher@du.edu
720-799-3466

Research Study Seeking Participants from Family in Early Intervention-For Service Coordinators

TITLE: Outdoor Early Intervention: Current Practices and Future Direction
Principal Investigator: Tiffany Lee
Protocol #: 1592795-2

DU IRB Exemption Granted: 08/25/20

Are you a service coordinator for early intervention?

If so, please consider helping a grad student recruit EI families to complete a 10-minute survey on information regarding their time going outside with their EI provider, benefits going outside with their child, and barriers that prevent them from going outside. This survey is available for English and Spanish speaking families!

With your help, we can advocate for families to spend more time outside. Also, this information will be used for future research to create interventions that will support EI families.

The survey is completely anonymous. For families who complete this survey they will receive a $10-dollar gift card. All you have to do is send the attached flyer to your families through email. A perfect opportunity to do this is during monthly check ins, transition meetings or 6 months reviews.

For your help, you will receive a $10-dollar gift card every time you send this survey to 10 families! Notify me when you send this survey to 10 families and I will send you the gift card. You are eligible for this offer up to four times.

I hope that this survey will help future families with interventions that can help them enjoy their everyday routines. If you are interested in learning more, please contact me.

Your participation is greatly appreciated!

Sincerely,

Tiffany Lee, MA
Doctoral Student
Child, Family, and School Psychology
University of Denver
Tiffany.reiher@du.edu
720-799-3466

Research Study Seeking Participants from Families in Early Intervention- For Families

TITLE: Outdoor Early Intervention: Current Practices and Future Direction
Principal Investigator: Tiffany Lee
Protocol #: 1592795-2

DU IRB Exemption Granted: 08/25/20

Are you a caretaker that is actively involved in early intervention (EI) sessions with a child that has qualified for services?

If so, please consider helping a grad student by completing a 10-minute survey on information regarding, how you spend time outside with your provider. If you have not gone outside with your provider, you can still complete the survey! This survey is looking at perceived benefits outdoor time may have for your family and perceived barriers that prevent you from going outside with your provider and/ or child.

With your help, we can advocate for families to spend more time outside. Also, this information will be used for future research to create interventions that will support EI families.

The survey is completely anonymous. For caretakers who complete this survey, you will receive a $10-dollar gift card! To keep your information anonymous, you will be asked to complete a second survey that asks for your name, email address, and preference for gift card. This second survey will not be connected with the original survey.

I hope that this survey will help future families with interventions that can help them enjoy their everyday routines. If you are interested in learning more, please contact me.

Your participation is greatly appreciated!

Sincerely,

Tiffany Lee, MA
Doctoral Student
Child, Family, and School Psychology
University of Denver
Tiffany.reiher@du.edu
720-799-3466

Appendix B: OEIS Version One

QUESTION	RESPONSE	NOTES
What is the current state of Outdoor EI?		
Prevalence and Current Benefits		
Have you gone outside with your provider?	Yes or No	Skip pattern for those that answer no
Since you have started EI, how often do you go outside	All the time, most of the time, occasionally, some of the time, never	Only those who say yes will answer this question
Please check all of the following outside places you have gone with your provider	Backyard/ Front yard Zoos Gardens Nature centers Nature trails Outdoor swimming pools Open spaces that include grass/dirt/rock Neighborhood parks State parks National parks Other	Only those who say yes will answer this question
When outside, my provider helps me: check all that apply	Keeping my child safe Teaching my child different ways to play Helping me interact with my child outside Helping my child meet their identify goals other	Only those who say yes will answer this question
I like going outside with my provider	5-point: Strongly agree-Strongly disagree	Only those who say yes will answer this question
I feel confident outside with my provider	5-point: Strongly agree-Strongly disagree	Only those who say yes will answer this question
My child likes going outside with our provider	5-point: Strongly agree-Strongly disagree	Only those who say yes will answer this question
My child feels confident outside with our provider	5-point: Strongly agree-Strongly disagree	Only those who say yes will answer this question
What are the perceptions of desirability regarding Outdoor EI?		
Promotion of Positive Attitudes		

I think going outside with my child is important	5-point: Strongly agree-Strongly disagree	Everyone
I think outdoor learning is important	5-point: Strongly agree-Strongly disagree	Everyone
I want to go outside with our provider	5-point: Strongly agree-Strongly disagree	Everyone
Promotion of Child Development & Resiliency		
Spending time outside will help my child achieve their EI goals	5-point: Strongly agree-Strongly disagree	Everyone
Spending time outside will help me achieve my child's EI goals	5-point: Strongly agree-Strongly disagree	Everyone
Spending time outside with our provider will help me learn how to keep my child safe	5-point: Strongly agree-Strongly disagree	Everyone
Promotion of Outdoor Exploration		
Spending time outside will allow my child to play with natural materials (e.g. sticks, sand, rocks)	5-point: Strongly agree-Strongly disagree	Everyone
I believe that the outdoors will allow me to engage in different activities with my family	5-point: Strongly agree-Strongly disagree	Everyone
I think outdoor activities will increase my confidence as a parent	5-point: Strongly agree-Strongly disagree	Everyone
Promotion of Family Engagement		
Spending time outside can help my parenting	5-point: Strongly agree-Strongly disagree	Everyone
Spending time outside with my provider will keep me engaged	5-point: Strongly agree-Strongly disagree	Everyone
Spending time outside will keep me focused on the session	5-point: Strongly agree-Strongly disagree	Everyone
Promotion of Family Support		
I believe that having more time outside will allow my child to play with other children their age	5-point: Strongly agree-Strongly disagree	Everyone

I believe that playing outside will allow me to connect to other parents	5-point: Strongly agree-Strongly disagree	Everyone
What are the perceptions of barriers regarding Outdoor EI?		
Provider Barriers		
My provider doesn't give me the choice to go outside	5-point: Strongly agree-Strongly disagree	Everyone
My provider has avoided going outside	5-point: Strongly agree-Strongly disagree	Everyone
I think my provider doesn't value going outside	5-point: Strongly agree-Strongly disagree	Everyone
Environmental Barriers		
My neighborhood is not safe for outdoor play	5-point: Strongly agree-Strongly disagree	Everyone
The weather prevents us from going outside	5-point: Strongly agree-Strongly disagree	Everyone
We do not have a place close to us that allows us to play outside	5-point: Strongly agree-Strongly disagree	Everyone
It takes too much time to have sessions outside	5-point: Strongly agree-Strongly disagree	Everyone
Personal Barriers		
I am too tired to go outside	5-point: Strongly agree-Strongly disagree	Everyone
My work (e.g. housework, job) prevents us from going outside	5-point: Strongly agree-Strongly disagree	Everyone
I fear going outside	5-point: Strongly agree-Strongly disagree	Everyone
I fear having my child play outside	5-point: Strongly agree-Strongly disagree	Everyone
I think screen time is more important that going outside	5-point: Strongly agree-Strongly disagree	Everyone
I think there are things to do inside our home that is more important than going outside	5-point: Strongly agree-Strongly disagree	Everyone
I worry about what other people think of my child	5-point: Strongly agree-Strongly disagree	Everyone
Child Barriers		

My child has fears going outside	5-point: Strongly agree-Strongly disagree	Everyone
My child doesn't like going outside	5-point: Strongly agree-Strongly disagree	Everyone
My child would rather have screen time than be outside	5-point: Strongly agree-Strongly disagree	Everyone
My child would rather do other activities than go outside	5-point: Strongly agree-Strongly disagree	Everyone
My child doesn't know how to play with other peers when we are outside	5-point: Strongly agree-Strongly disagree	Everyone
There are medical reasons why we don't go outside	5-point: Strongly agree-Strongly disagree	Everyone
My child has medical concerns that interfere with going outside	5-point: Strongly agree-Strongly disagree	Everyone
Closing Question		
Are there any other questions that you think would be valuable for us to ask in this survey to know more about outdoor EI services.	Open Ended	Everyone
Demographics		
What is your zip code?	Open Ended	Everyone
Please check all that apply. What area(s) did your child qualify for early intervention services	Cognitive Communication Social Emotional Adaptive Motor I don't know	Everyone
What type of service(s) is your child receiving?	List out all services	Everyone
How long has your child been enrolled in EI?	6-month intervals	Everyone
How many months old is your child?	6-month intervals	Everyone
What is your relationship to the child receiving EI services?	Biological parent Adaptive parent Foster parent Grandparent Aunt/ Uncle	Everyone

	Sibling Cousin Family Friend Other	
Does your child receive Medicaid services?	Yes or No	Everyone
How does your family identify your ethnicity/ race?	List out different ethnicity/ race	Everyone
What is your marital status?	Married Divorce Single	Everyone
Is your child exposed to more than one language?	Yes or No	Everyone
Is English the primary language in the home?	Yes or No	Everyone
I am actively involved in my sessions with my provider	all of the time Some of the time Occasionally Rarely never	Everyone

Appendix C: Question Appraisal System (QAS-99) Coding Form

INSTRUCTIONS. Use one form for EACH question to be reviewed. In reviewing each question:

1) WRITE OR TYPE IN QUESTION NUMBER. ATTACH QUESTION.

Question number or question here:

2) Proceed through the form - Circle or highlight YES or NO for each Problem Type
3) Whenever a YES is circled, write detailed notes on this form that describe the problem.

STEP 1 - READING: Determine if it is difficult for the interviewers to read the question uniformly to all respondents.	
1a. **WHAT TO READ**: Interviewer may have difficulty determining what *parts* of the question should be read.	YES NO
1b. **MISSING INFORMATION**: Information the interviewer needs to administer the question is *not* contained in the question.	YES NO
1c. **HOW TO READ**: Question is *not* fully scripted and therefore difficult to read.	YES NO
STEP 2 - INSTRUCTIONS: Look for problems with any introductions, instructions, or explanations from the *respondent's* point of view.	
2a. **CONFLICTING OR INACCURATE INSTRUCTIONS**, introductions, or explanations.	YES NO
2b. **COMPLICATED INSTRUCTIONS**, introductions, or explanations.	YES NO
STEP 3 - CLARITY: Identify problems related to communicating the *intent or meaning* of the question to the respondent.	
3a. **WORDING**: Question is lengthy, awkward, ungrammatical, or contains complicated syntax**.**	YES NO
3b. **TECHNICAL TERM(S)** are undefined, unclear, or complex.	YES NO
3c. **VAGUE:** There are multiple ways to interpret the question or to decide what is to be included or excluded.	YES NO
3d. **REFERENCE PERIODS** are missing, not well specified, or in conflict.	YES NO

STEP 4 - ASSUMPTIONS: Determine if there are problems with assumptions made or the underlying logic.	
4a. **INAPPROPRIATE ASSUMPTIONS** are made about the respondent or about his/her living situation	YES NO
4b. **ASSUMES CONSTANT BEHAVIOR** or experience for situations that vary.	YES NO
4c. **DOUBLE-BARRELED**: Contains more than one implicit question.	YES NO
STEP 5 - KNOWLEDGE/MEMORY: Check whether respondents are likely to *not know* or have trouble *remembering* information.	
5a. **KNOWLEDGE** may not exist: Respondent is unlikely to *know* the answer to a factual question.	YES NO
5b. **ATTITUDE** may not exist: Respondent is unlikely to have formed the attitude being asked about.	YES NO
5c. **RECALL** failure: Respondent may not *remember* the information asked for.	YES NO
5d. **COMPUTATION** problem: The question requires a difficult mental calculation.	YES NO
STEP 6 - SENSITIVITY/BIAS: Assess questions for sensitive nature or wording, and for bias.	
6a. **SENSITIVE CONTENT** (general): The question asks about a topic that is embarrassing, very private, or that involves illegal behavior.	YES NO
6b. **SENSITIVE WORDING** (specific): Given that the general topic is sensitive, the wording should be improved to minimize sensitivity.	YES NO
6c. **SOCIALLY ACCEPTABLE** response is implied by the question.	YES NO
STEP 7 - RESPONSE CATEGORIES: Assess the adequacy of the range of responses to be recorded.	
7a. **OPEN-ENDED QUESTION** that is inappropriate or difficult.	YES NO
7b. **MISMATCH** between question and response categories.	YES NO
7c. **TECHNICAL TERM(S)** are undefined, unclear, or complex.	YES NO
7d. **VAGUE** response categories are subject to multiple interpretations.	YES NO
7e. **OVERLAPPING** response categories.	YES NO
7f. **MISSING** eligible responses in response categories.	YES NO

7g. **ILLOGICAL ORDER** of response categories.	YES NO
STEP 8 - OTHER PROBLEMS: Look for problems not identified in Steps 1 - 7.	
8. Other problems not previously identified.	YES NO

Appendix D: Cognitive Interview Recruitment Email Parent

Dear Preservice Parent,

My name is Tiffany Lee and I am a Ph.D. candidate from the Child, Family, and School Psychology program at the University of Denver. I am writing to invite you to participate in a cognitive interview on survey questions I developed related to current practices of Early Intervention (EI) sessions happening outside and preservice parents' perceptions of benefits and barriers to outdoor EI sessions. The purpose of the cognitive interview is to determine if there is any confusion in vocabulary or phrasing of the survey questions. Since natural environments is critically important for children development, this instrument seeks to gain insight on how natural environments are being used and how we can help future families in EI access these environments.

If you decide to participate in this study, you will be asked to sit with me and complete a self-report 5-point scale survey of 53 questions and 12 demographic questions. I will observe you as you take the survey and may ask you follow-up questions. I will record your responses in a password protected Microsoft Word document, which will be destroyed upon completion of my research. The cognitive interview will take between 30 to 60 minutes and will occur at a location that is convenient for you. The interview may be scheduled after work or on a weekend, depending on your scheduling preference.

Please note, this is completely voluntary. Your participation is completely voluntary, and you can choose to or choose not to participate in the cognitive interview. If you'd like to participate or have any questions about the study, please contact me at tiffany.reiher@du.edu or 720-799-3466. You may also contact my faculty sponsors, Dr. Gloria Miller, at gloria.miller@du.edu or 303-871-3340 or Dr. Jeanine Coleman, at jeanine.coleman@du.edu or 303-871-2496. Thank you for considering participating.

Sincerely,
Tiffany Lee, MA
Doctoral Student
Child, Family, and School Psychology
University of Denver
Tiffany.reiher@du.edu
720-799-3466

Appendix E: Cognitive Interview Recruitment Email Provider

Dear Preservice Provider,

My name is Tiffany Lee and I am a Ph.D. candidate from the Child, Family, and School Psychology program at the University of Denver. I am writing to invite you to participate in a cognitive interview on survey questions I developed related to current practices of Early Intervention (EI) sessions happening outside and preservice parents' perceptions of benefits and barriers to outdoor EI sessions. The purpose of the cognitive interview is to determine if there is any confusion in vocabulary or phrasing of the survey questions. Since natural environments is critically important for children development, this instrument seeks to gain insight on how natural environments are being used and how we can help future families in EI access these environments.

If you decide to participate in this study, you will be asked to sit with me and complete a self-report 6-point scale survey of 53 questions and 12 demographic questions. I will observe you as you take the survey and may ask you follow-up questions. I will record your responses in a password protected Microsoft Word document, which will be destroyed upon completion of my research. The cognitive interview will take between 30 to 60 minutes and will occur at a location that is convenient for you. The interview may be scheduled after work or on a weekend, depending on your scheduling preference.

Please note, this is completely voluntary. Your participation is completely voluntary, and you can choose to or choose not to participate in the cognitive interview. If you'd like to participate or have any questions about the study, please contact me at tiffany.reiher@du.edu or 720-799-3466. You may also contact my faculty sponsors, Dr. Gloria Miller, at gloria.miller@du.edu or 303-871-3340 or Dr. Jeanine Coleman, at jeanine.coleman@du.edu or 303-871-2496. Thank you for considering participating.

Sincerely,
Tiffany Lee, MA
Doctoral Student
Child, Family, and School Psychology
University of Denver
Tiffany.reiher@du.edu
720-799-346

Appendix F: OEIS Final Version

Early Intervention (EI): The program that provides services and supports to infants and toddlers and their families who have a developmental delay. In this survey the abbreviation of EI will be used to describe this program.
Provider: The person or persons who have been assigned to work with your family to support the needs of your child. The provider works on interventions specific to your family. This is the person that you interact with frequently. Sometimes the provider may refer to themselves as a therapist or teacher.
Sessions: Visits that occur with the provider.
Outside: These spaces may have natural elements such as plants, animals, dirt, grass and other features of the earth. Being "outside" includes environments that are in open-air. Such examples may include backyard and parks. Typically, these settings do not take place in confined buildings.
IFSP Outcomes: These are the goals that you created for your child. This is done when you first start the program after you qualify for services and they are updated every 6 months during reviews.

Intro Statement:

In this survey you will be asked questions regarding outdoor supports needed for your family. This survey is intended to gather data on how Early Intervention may help you navigate the outdoors with your child. We hope this information will be able to inform providers with specific interventions to help future families. This survey was in the making prior to Covid-19, please answer these questions as if you had the ability to meet in-person with your provider.

QUESTION	**RESPONSE**
This section is looking at what you are already doing with your provider.	
Are you involved with your child's EI session?	Yes, No, Sometimes
Have you gone outside with your provider?	Yes or No
Since you have started EI, how often do you go outside with your provider?	· All the time · most of the time · occasionally · some of the time · never

Check all that apply. I have gone to the following places with my provider:	· Backyard/ Front yard · Zoos · Gardens · Nature centers · Nature trails · Outdoor swimming pools · Open spaces that include grass/dirt/rocks · Parks/ playgrounds · State parks · National parks · Other
Check all that apply. When outside, my provider supports me to:	· Keep my child safe · Teach my child different ways to play · Help me interact with my child outside · Use different environments to practice skills · Help my child learn how to navigate playground equipment and other outdoor environments by using their body . Support my child's interaction with other children and adults . Encourage my child to be curious and explore . Help my child recognize and label new objects . Encourage my child to be more independent Help my child transition from outside

	· Other
I like going outside with my provider	Strongly agree, agree, neutral, disagree, strongly disagree
I feel confident outside with my provider	Strongly agree, agree, neutral, disagree, strongly disagree
My child likes going outside with our provider	Strongly agree, agree, neutral, disagree, strongly disagree
This section is looking at how important going outside is to you.	
I think going outside with my child is important	Strongly agree, agree, neutral, disagree, strongly disagree
I think outdoor learning is important	Strongly agree, agree, neutral, disagree, strongly disagree
I want to go outside with our provider	Strongly agree, agree, neutral, disagree, strongly disagree
This section is looking at how going outside may help your child's development	

Spending time outside will help my child achieve their IFSP outcomes	Strongly agree, agree, neutral, disagree, strongly disagree
Spending time outside with our provider will help me support my child's development	Strongly agree, agree, neutral, disagree, strongly disagree
This section is looking at how outdoor play may help you and your child explore different environments	
Spending time outside with our provider will allow my child to play with natural materials (e.g., sticks, sand, rocks)	Strongly agree, agree, neutral, disagree, strongly disagree
I think being involved in outdoor activities with our provider will help me learn how to support my child in different environments	Strongly agree, agree, neutral, disagree, strongly disagree
Check all that apply. I would like help from my provider with the following:	· Keeping my child safe · Teaching my child different ways to play · Helping me interact with my child outside · Using different environments to practice skills · Helping my child learn how to navigate playground equipment and other outdoor environments by using their body . Supporting my child's interaction with other children and adults . Encouraging my child to be curious and explore

	. Helping my child recognize and label new objects . Encouraging my child to be more independent Helping my child transition from outside · Other
This section is looking at how outdoor time may help you engage with your child	
Spending time outside with my provider can help me increase my parenting skills	Strongly agree, agree, neutral, disagree, strongly disagree
Spending time outside with my provider will keep me engaged in my child's session	Strongly agree, agree, neutral, disagree, strongly disagree
Spending time outside will keep me focused on the session	Strongly agree, agree, neutral, disagree, strongly disagree
This section is looking at how the outdoors may increase social support with you and your child	
I believe that having more time outside will allow my child to play with other children their age	Strongly agree, agree, neutral, disagree, strongly disagree
I believe that playing outside will allow me to connect with other parents	Strongly agree, agree, neutral, disagree, strongly disagree

I believe that playing outside will help increase family activities	Strongly agree, agree, neutral, disagree, strongly disagree
This section is looking at what may prevent you and your child from going outside.	
Provider Barriers	
My provider doesn't give me the choice to go outside	Strongly agree, agree, neutral, disagree, strongly disagree
My provider has avoided going outside	Strongly agree, agree, neutral, disagree, strongly disagree
It is hard for me to communicate with my provider	Strongly agree, agree, neutral, disagree, strongly disagree
Covid-19 has prevented us from going outside with our provider	Strongly agree, agree, neutral, disagree, strongly disagree
Environmental Barriers	
My neighborhood is not safe for outdoor play	Strongly agree, agree, neutral, disagree, strongly disagree
The weather prevents us from going outside	Strongly agree, agree, neutral, disagree, strongly disagree
We do not have a place close to us that allows us to play outside	Strongly agree, agree, neutral, disagree, strongly disagree
It is hard to communicate with other families (e.g., language and social barriers)	Strongly agree, agree, neutral, disagree, strongly disagree
Covid-19 has prevented us from going outside	Strongly agree, agree, neutral, disagree, strongly disagree
Personal Barriers	
I am too tired to go outside	Strongly agree, agree, neutral, disagree, strongly disagree

My work (e.g., housework, job) prevents us from going outside	Strongly agree, agree, neutral, disagree, strongly disagree
I fear going outside because of the unknown	Strongly agree, agree, neutral, disagree, strongly disagree
I fear having my child play outside because of safety concerns (e.g., running in the street, falling off equipment, putting things in their mouth)	Strongly agree, agree, neutral, disagree, strongly disagree
I give my child screen time instead of going outside because it is easier	Strongly agree, agree, neutral, disagree, strongly disagree
I think there are things to do inside our home that are more important than going outside (e.g., academics, reading, life skills)	Strongly agree, agree, neutral, disagree, strongly disagree
I worry about what other people think of my child	Strongly agree, agree, neutral, disagree, strongly disagree
I need extra support when going outside (e.g., someone helping with siblings)	Strongly agree, agree, neutral, disagree, strongly disagree
I do not think outdoor time is important	Strongly agree, agree, neutral, disagree, strongly disagree
I do not feel connected with my neighbors	Strongly agree, agree, neutral, disagree, strongly disagree
I avoid taking my child outside because they may not listen to my commands	Strongly agree, agree, neutral, disagree, strongly disagree
Covid-19 has made me afraid of going outside with my family	Strongly agree, agree, neutral, disagree, strongly disagree
Child Barriers	
My child has fears going outside (e.g., loud sounds, unfamiliar people and places)	Strongly agree, agree, neutral, disagree, strongly disagree
My child doesn't like going outside	Strongly agree, agree, neutral, disagree, strongly disagree

My child would rather have screen time than be outside	Strongly agree, agree, neutral, disagree, strongly disagree
My child would rather do other activities than go outside (e.g., Legos, art, Play-Doh)	Strongly agree, agree, neutral, disagree, strongly disagree
My child doesn't know how to interact with other peers when we are outside	Strongly agree, agree, neutral, disagree, strongly disagree
My child has medical reasons that prevent us from going outside	Strongly agree, agree, neutral, disagree, strongly disagree
My child cannot navigate the playground or other outdoor environments due to their physical abilities	Strongly agree, agree, neutral, disagree, strongly disagree
My child is distracted outside (e.g., does not focus on the EI session)	Strongly agree, agree, neutral, disagree, strongly disagree
My child has a hard time transitioning from one activity to another (e.g., outside back inside)	Strongly agree, agree, neutral, disagree, strongly disagree
My child is afraid to go outside because of covid-19	Strongly agree, agree, neutral, disagree, strongly disagree
This helps learn a little more about you.	
What is your zip code?	Open Ended
Check all that apply. In what area(s) did your child qualify for EI services?	· Cognitive (e.g., play skills, problem solving) · Communication (e.g., using words, understand directions) · Social Emotional (e.g., behaviors, emotions) · Adaptive (e.g., eating, dressing) · Motor (e.g., walking, hand movements) -Multiple areas · I don't know

Check all that apply. Who is providing services to your child	· Speech and Language Therapists (e.g., helps my child talk/listen) · Developmental Interventionist (e.g., helps my child with more than one area) · Occupational therapist (e.g., helps my child eat or sensory needs) · Physical therapist (e.g., helps my child move their body) · Social Emotional provider (e.g., helps my child with behaviors and emotions) · Other (e.g., nutritionist, vision therapy) -multiple therapists · I don't know
How long has your child been enrolled in EI?	0-3 months 4-7 months 8-11 months 12-15 months 16-19 months 20 or more months
What age range best describes your child?	0-3 months-old 4-7 months-old 8-11 months-old 12-15 months-old 16-19 months-old 20 or more months-old
What is your relationship to the child receiving EI services?	· Biological parent · Adoptive parent · Foster parent · Grandparent · Aunt/ Uncle · Sibling · Cousin · Family friend · Other

What type of insurance does your family have?	Private/employer, Medicaid, None, Other, prefer not to answer
Please check all that apply: How does your family identify your ethnicity/ race?	White Black or African American Hispanic/ Latino/a American Indian Alaska Native Chinese Filipino Asian Indian Vietnamese Korean Japanese Other Asian Native Hawaiian Samoan Chamorro Other Pacific Islander Multiracial Prefer not to answer
What is your marital status?	· Married · Partnered · Divorced · Separated · Single
Is your child exposed to more than one language?	Yes or No
Is English the primary language in the home?	Yes or No
Covid-19 has impacted the way I view going outside	Strongly agree, agree, neutral, disagree, strongly disagree