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Parents and Young Children with Disabilities: The Effects of Home-Based Parent Education in Music on Parent-Child Interactions

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THE FLORIDA STATE UNIVERSITY

COLLEGE OF MUSIC

PARENTS AND YOUNG CHILDREN WITH DISABILITIES: THE EFFECTS OF
HOME-BASED PARENT EDUCATION IN MUSIC ON PARENT-CHILD INTERACTIONS

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ABSTRACT

The purpose of this study was to investigate the effect of parent-child dyads' participation in a home-based music education program on parent-child interactions. All participating dyads included children with disabilities or developmental delays between one and three years of age. Secondary purposes of the study were to examine parents' use of education materials within daily routines, and parents' perceptions regarding the benefits of program participation. A pretest-posttest within-subject single group design was used for this study. The independent variable was a six-week education program provided to families in their homes. Responsive teaching strategies, proposed by Mahoney and MacDonald (2007), were incorporated into the education program. Responsive teaching strategies refer to affect (using animated expressions), match (adjusting responses according to children's developmental levels, interests and behavior styles), reciprocity (engaging in frequent physical or verbal exchanges), shared control (facilitating children's lead in play), and contingency (responding immediately to children's behaviors). Dependent measures included behavioral observations of parents' positive physical and verbal responses, and children's positive physical and verbal initiations, as well as parent questionnaires. Results indicated parents' positive physical and verbal responses increased significantly pre- to post-intervention. Children's verbal initiations also increased significantly pre- to post-intervention; however, children's physical initiations did not increase significantly. Results also revealed that parent-child synchrony improved significantly pre- to post-intervention. Furthermore, results from parent questionnaires indicated significant post-intervention effects on parents' perceived: music abilities, degree of comfort using music with their children, and parent-child interaction characteristics. Overall parent-child playtime increased pre- to post-intervention, as well as the quantity and quality of musical play. Among the four types of music activities (singing, playing instruments, moving to music, and listening to music), the home-based music education program had the greatest impact on parents' use of instrument-playing activities. Parent-participants identified playing musical games as the most beneficial music activity for their children and the family. Parents reported the most beneficial responsive teaching strategy was matching—adjusting their responses according to their child's developmental level, interests, and behavior styles. Lastly, follow-up data indicated 92% of the

parent-participants continued to use the music activities and education materials with their children three months after completion of the study.

CHAPTER ONE

INTRODUCTION

Developmental disabilities have affected a significant number of children and their families in the United States. Data indicate that the prevalence of development-related disabilities has increased from 12.84% to 15.04% in children aged 3 to 17 years over a 12-year period (Boyle et. al., 2011). Children with disabilities or developmental delays may confront difficulties in their physical, cognitive, communicative, or social and emotional development. A child's developmental concerns often affect relationships and dynamics within the family. Most parents are eager to do as much as they can to help their children. At the same time, parents of children with disabilities or developmental delays may experience caregiver strain due to parenting stress, disrupted family relationships, financial difficulties, restrictions on leisure activities, and disrupted social relationships. Interactions between parents and children with disabilities are often more challenging than those between parents and children without disabilities.

Importance of the Parent-Child Interactions

The parent-child relationship has been identified as a factor that directly relates to variations in children's emotional, behavioral, and social development (Cox & Paley, 1997; Schroeder & Kelly, 2010; Waters & Cummings, 2000). The quality of parent-child interactions has been found to be one of the most consistent predictors of a child's cognitive and social development (National Institute of Child Health and Human Development, 2006). Parents need to be informed that early parent-child interactions have long-term effects on their children in terms of language, cognitive, and social-emotional development, peer acceptance, and academic performance. Positive early experiences, especially stable relationships with caring and responsive parents/caregivers, and safe and supportive environments, all affect a young child's overall development. Children are like mirrors that reflect how their parents interact with and respond to them.

Interactions between parents and their children typically involve eye contact, physical touch, vocal tonality, facial expression, and verbal exchanges. Parents and children interact

during basic childcare activities, mealtime, transportation time, playtime, and bedtime. Parent-child interactions take place during the sharing of experiences in the everyday life of the dyad and the family. The ways parents respond to their children serve as important social references while young children explore their surrounding environments.

Overall, parents of children with disabilities or developmental delays have been described as more directive, less responsive, and less attentive to their children than parents of children without disabilities (Dawson, Hill, Spencer, Galpert, & Watson, 1990; Pennington & McConachie, 2001; Tannock, 1988; Sanberg & Liliedahl, 2008). Parents of children with developmental delays or disabilities may find it difficult to engage their children due to the social-communication or cognitive deficits of their children. Parents may also seem unduly demanding because they have not learned to adjust their expectations to their children's developmental levels. Parents of children with disabilities must learn to read their children's communication cues in order to respond appropriately. Parents and other family members provide children with their first social environment, and are responsible for the way their children's social-emotion and communication developments emerge. Smooth-flowing and mutually communicative interactions are the main goal for high quality parent-child interactions.

Parent-child synchronous behaviors are one of the indicators for assessing the quality of parent-child interactions. Characteristics of synchronous interactions include sustained and shared focus of attention, emotional attunement, and physical and verbal exchanges between parents and children. Parent-child synchrony is related to child development, especially in the language and social-emotional domains. Observations of parents and their children during play provide information about parent-child interaction styles and the presence and degree of synchronous behaviors. During parent-child play interactions, synchronous behaviors include: (1) parents following their child's lead for determining what types of toys they will play with; (2) parents commenting on the objects their children are interested in or on children's reactions toward the objects; (3) parents and children participating in the same activities; (4) children verbally or physically responding to parents' play initiations; and (5) parents matching their children's emotional or behavioral styles. Parents of children with disabilities might have difficulties succeeding in these types of play behaviors due to the severity of their children's disabilities (Wilder, Axelsson, & Granlund, 2004) or social-communication deficits (Landa, Holman, O'Neill, & Stuart, 2011).

Harmonious and supportive interactions allow for optimal and effective communication between parents and their young children. Healthy interactions between parents and young children include frequent turn-taking and shared lead roles. Healthy parent-child interactions are vital to the development of children with disabilities. These interactions help to promote appropriate social and academic outcomes for children. To increase children's developmental and educational gains, families with children who have disabilities or developmental delays should consider early intervention services and seek help from professionals.

Importance of Early Intervention Services

Early intervention services are not only beneficial to children with developmental disabilities but also to their families. Interventions are likely to be more effective and less costly when they are provided early in a child's life. High-quality early intervention services can change a child's developmental trajectory and improve a family's quality of life. The program for infants and toddlers with disabilities, Part H of the Individual Disabilities Education Acts (IDEA) from 1987 to 1996 and Part C of IDEA after 1997, is a federal grant program that assists states in operating statewide, comprehensive, coordinated, multidisciplinary early intervention services to infants and toddlers with disabilities (from birth to age three) and to their families. According to the U. S. Department of Education, Office of Special Education Programs, 2.82% of infants and young children received early intervention services (Individuals with Disabilities Education Act Data, 2012). This number has increased gradually during the past decade.

Early intervention experts can do much to improve the lives of children with disabilities and their parents. Early intervention is a term that refers to a broad array of services and activities designed to promote a young child's development. An Individualized Family Service Plan (IFSP) documents and guides the early intervention process, and it is the vehicle through which effective early intervention is implemented according to Part C of IDEA. Early intervention starts with a comprehensive assessment of the child's and the family's strengths and needs. Early intervention programs also provide appropriate services and supports to actively monitor and reevaluate children as they develop. The success of early intervention is dependent upon the individuals participating in the program, and the goals set for the child and the family. Intervention plans are normally developed in collaboration with professionals and parents and are built upon a family's beliefs, values, and priorities.

Part C of IDEA also states that early intervention services should be delivered in natural environments, including home and community settings in which children without disabilities also participate. A natural environment is any place where young children and families live, learn, play and spend time. The natural environment is an essential aspect of Part C services and refers to the settings and activities in which young children and their families normally engage. Collaboration between early interventionists and parents/caregivers within natural environments is key to providing quality, family-centered early intervention services. At the core of early intervention philosophy is the premise that services should be provided within the context of the family, and should be directed toward the needs of the entire family, not just the needs of the child. The rationale for a family-centered approach is that the family is the most influential and constant factor in a young child's development, and as such, has the greatest impact on the child's ability to reach his or her ultimate potential (O'Malley & Smith, 2001). A child's development, as well as parents' well-being, is enhanced when families are provided with family-centered early intervention services.

Parents are key to the development and wellbeing of their young children. According to data reported by Mahoney and Wiggers (2007), "if a child were enrolled in a special education or early intervention classroom or playgroup and also received developmental therapy once each week, in one year parents would have at least 200,000 more interactions, or opportunities to influence their children's development, than teachers and therapists combined" (p. 9). In addition, experts in the early intervention field also claim that children with disabilities require specialized strategies that match their learning modes and rates in order to ensure their healthy development (Ramey & Ramey, 1998). For parents who want to help their children, early intervention education programs provide them with useful strategies they can use to assist their children on a daily basis. Education that fits parents' needs empowers them to aid their children's development. Researchers have found that parents who received education experienced: increased positive interactions with their children, increased satisfaction with their parenting skills, and less stress while rearing their children (Mahoney, Boyce, Fewell, Spiker, & Wheeden, 1998; Singh, et al., 2007; Stephenson, Martin, & Linfoot, 2005). Parents need education that does not overburden them. Education should make parenting easier and make the time spent with their children more enjoyable.

Music Therapy and the Family

Music therapy can benefit the families of children with developmental disabilities by enhancing parent-child interactions. Researchers have found that parents' participation in music programs can result in reduced irritability, increased sensitivity toward their children, increased engagement with their children, and improved mental health (Allgood, 2005; Mackenzie & Hamlett, 2005; Nicholson, Berthelsen, Abad, Williams, & Bradley, 2008; Shoemark, 1996; Vlismas & Bowes, 1999; Walworth, 2009; Wylie, 2004). Parents who learn to enjoy their children will spend more time with them. By singing, playing, and moving to music, parents can easily engage in play with their children.

Music can facilitate parent-child interactions when both children and parents enjoy making music together. Musical play allows young children to explore, create, and improvise with their voices and various musical instruments. The active participation of parents in music activities is particularly essential for children during the pre-verbal stage, which is the stage during which many delays are detected. Through interactive play experiences in music, parents learn how their children relate to their surrounding environments and to people, and how their children display their preferences and show interests in new experiences. Music provides a safe and stimulating learning environment for young children to share ideas with their parents. Music allows young children to express themselves and to be creative. Parents are not only their children's first teachers, but also an audience that can appreciate and share moments of musical play.

Parents can learn much about their child's development through the ways he or she engages with music. An investigation regarding the uses of music in families with children who have developmental disabilities and delays indicated that families listen, sing, and move to music with their children, but seldom play musical instruments (Yang, 2011). Parents who participated in the study stated that they would like to learn more about how to use music to engage and to interact with their children. Even though some parents enrolled their children in early childhood music classes, most programs did not take place in the home, were not child-centered or family-oriented, and most music programs were not provided by music therapists trained to meet the specific needs of families with disabilities (Yang, 2011).

Music therapists are trained professionals who work with families of children with developmental delays or disabilities on specific family and child concerns via musical activities.

Adamek and Darrow (2010) suggested that music therapists can not only provide services to children with disabilities, but can also provide education to family members, enhance the care-giving capacity of the family, provide respite care for family members, and thus improve families' quality of life. A well-designed music-based education program should teach parents how to transfer those skills learned in the music setting to their daily lives. Children with disabilities or developmental delays benefit most when strategies occur on a regular basis and throughout the day.

Consistent with the goals of the family-centered service philosophy, parent education should enhance the quality of family interactions, and transform these interactions into highly efficient learning opportunities. Music programs designed for joint participation of the parent-child dyad were reported to be beneficial for children with disabilities or developmental delays (Allgood, 2005; Muller & Warwick, 1993; Nicholson, Berthelsen, Abad, Williams, & Bradley, 2008; Oldfield, 2008; Shoemark, 1996; Walworth, 2009); however, all interventions were conducted in clinics or community outreach settings. Music therapists can do much to enhance parents' education in the home. When music therapy interventions are delivered in a home environment, parents and children learn skills in a familiar setting. By doing so, parents and children do not have to transfer skills they learned from the clinic or classroom to the home. Additionally, by working individually and closely with families, music therapists can provide specific feedback regarding the needs of each parent-child dyad. Music therapists can also help the family embed learned strategies into the child's daily routines. Although the music therapy literature includes documentation on the importance of home-based interventions (Pasiali, 2004, 2010), and of parent-child relationships (Nicholson, Berthelsen, Abad, Williams, & Bradley, 2008; Shoemark, 1996; Paisali, 2010; Walworth, 2009; Whipple, 2000), further investigation is warranted on the combination of early intervention and home-based strategies for families with disabilities. Home-based and family-centered music therapy programs have the potential to incorporate interventions that are unique to each family's style and needs, and to optimize the benefits of other early intervention family-centered programs.

Purpose Statement

The present study will contribute to the literature by examining the benefits of a music therapy parent education program designed for home use, and for families with young children

(under three years of age) who have disabilities or developmental delays. The music-based education program is also designed to improve parent-child interactions and parent-child synchrony. Therefore, the purposes of this study were: (1) to investigate the effect of program participation on parent-child interactions during free play, (2) to investigate the effect of program participation on parent-child synchrony during free play, (3) to investigate the parents' perceptions regarding the benefits of program participation, and (4) to examine the parents' use of education materials within their children's daily routines.

CHAPTER TWO

REVIEW OF LITERATURE

This chapter includes a review of literature in the following areas: parent-child interactions, early intervention programs for families of children with disabilities and developmental delays, and music with young children and their families. The research presented provides the framework and rationale for the present study by defining the importance of early intervention programs and parent-child interactions on children's communication skills, as well as the influence of music-based parent education programs on children's prosocial behaviors.

Parent-Child Interaction

Social interactions between children and parents convey messages, emotions, and needs. These interactions also serve as the foundation for a child's development. Parent-child interactions were found to have a direct relationship to children's language development, cognitive development, social-communicative development, as well as social competence, early literacy skills, and academic achievement (Connell & Prinz, 2002; Dodici, Draper, & Peterson, 2003; Gregory & Rimm-Kaufman, 2008; MacDonald & Parke, 1984; Magill-Evans & Harrison, 2001; Murray & Hornbaker, 1997; Wetherby & Prizant, 2000). According to Kuczynski, Lollis, and Koguchi (2003), parent-child interactions refer to the specific moment-to-moment experiences that occur between parent and child and comprise the framework of the parent-child relationship. Parents and children influence each other's behaviors. An appropriate parent-child interaction is characterized by the child's clear expressive signals, the parents' positive responses to their child's needs, and the parents' use of a positive non-verbal communications (e.g. emotional tone, touch). Researchers have identified several indicators of positive parent-child interactions. These indicators include parents' positive support and acceptance exhibited through positive comments, gentle affectionate touch and smiling, and a child's engagement in sustained activities (Carta, et al. 2002). Responsive, sensitive, and warm parent-child interactions nurture a child's developmental outcomes.

Interactions between Parents and Children with Disabilities

Parent-child interactions take place as a sharing of experiences in the everyday life of the dyad and the family. Interactions between parents and children with disabilities are often different from those between parents and children who are developing typically. Children with disabilities and their parents sometimes experience difficulty with positive interactions and sustained engagements. Parenting styles, parental background, parental responsiveness, and parental affect, coupled with the child's disability, are influential to parent-child interactions (Kim & Mahoney, 2004; Trivette, Dunst, & Hamby, 2010).

Researchers have found that children with disabilities or developmental delays exhibit a variety of interactive characteristics that are related to their disabilities. Children with autism, for example, are less responsive to others' social cues (Bacon, et al., 1998; Jackson, et al., 2003; Kasari, et al., 1993); they produce fewer positive responses and more non-responses than children with intellectual disabilities (Jackson, et al., 2003). Both children with autism and intellectual disabilities tend to respond more frequently and positively to adults than to other children. Children with multiple disabilities, meanwhile, show their feelings and desires through smiles, eye movements, breathing, and different types of crying (Wilder & Granlund, 2003). For instance, a mother of a child with multiple disabilities described that when her daughter wants her to sing, the child touches the mother's lips. Additionally, when compared to children with typical development, children with disabilities or developmental delays have been found to exhibit fewer initiations, more negative and less adaptive interactive styles, and fewer positive affective displays (Kopp et al., 1992; Wilson, 1999). Children who produce ambiguous signals may make it more difficult for parents to sustain a smooth and connected flow of interactions.

Parents' responses to their children vary in relation to the severity of the children's disability and the children's ability to engage with them (Kasari, Sigman, Mundy, & Yirmiya, 1990; Kim & Mahoney, 2004). Kasari et al. (1990) stated that the more verbal and cognitively capable the child, the more caregivers engage in mutual play and positive feedback. Sandberg and Liliedahl (2008) also found that parents of young preschool children with severe speech and physical impairments were less attentive to their children's initiated communications than parents of children without such disabilities. Moreover, mothers of children with autism displayed fewer smiles and were less likely to smile in response to their children's smiles than

mothers of children with typical development (Dawson, Hill, Spencer, Galpert, & Watson, 1990).

Mothers of children with disabilities or developmental delays have been described as being more directive and controlling than mothers of children without disabilities (Beeghly, Weiss-Perry, & Cicchetti, 1989; Marfo, 1990; Pennington & McConachie, 2001; Schneider & Gearhart, 1988). Although Crawley and Spiker (1983) advised parents to follow their children's leads during play, moderate parental directiveness is sometimes required to guide children with disabilities or developmental delays. They claimed that children who are passive, inattentive, or unresponsive in the free-play context require more directive guidance from their parents. Children with disabilities benefit more from parental guidance if mothers can combine sensitivity and directiveness to form a stimulating learning environment. Tannock (1988) found that one positive outcome of parental directiveness was a child's increased engagement during interactions. Children have their own unique characteristics and interaction patterns. Parents of children with disabilities or developmental delays who appropriately adjusted their social communications according to the children's developmental characteristics and task demands found their children demonstrated increased attentiveness (Guralnick, Neville, Hammond, & Connor, 2008).

In order to promote children's initiated interactions, parents of children with disabilities should adjust their communication patterns to optimize parent-child communication effectiveness. In particular, parents need to adapt to their child's way of communication by being more attentive to their signals and giving more time for them to initiate or to respond. The communicative attempts of non-vocal children with disabilities sometimes require great effort (e.g. eye gaze, gestures, vocalizations, facial expressions) to complete a communication transaction. Light, Collier, and Parnes (1985) found that if caregivers paused longer (one second or more), the child made initiations more frequently. Similarly, Schneider and Hecht (1995) found that children decreased initiations or asked fewer questions when their mothers increased requests during a book-sharing activity.

Experts in child development suggest that a child's development depends whether the parents provide suitable stimulation and emotional support (Pino, 2000; Venuti, de Falco, Giusti, & Bornstein, 2008). The degree to which parents are sensitive, responsive, and emotionally attuned to their young children depends on their abilities to accurately recognize, understand, and

interpret their children's communicative behaviors (e.g. body language, facial expression, speech). Parents who are sensitive to their child's developmental level organize activities in ways that are appropriate to their child's ability and willingness to participate. Appropriate parental responsiveness is the key to maintaining positive parent-child interactions. Wilder and Granlund (2003) found that parents of children with disabilities believed a successful interaction with their children consisted of the child engaging in prolonged activity, concentrating, understanding, and expressing joy.

Parental Responsiveness

Early responsive parenting styles provide a foundation that allows children to feel secure and to develop a basic trust of their caregivers and their environments (Ainsworth, Blehar, Waters, & Wall, 1978). Parental responsiveness is a characteristic of parent-child interactions that has been considered a key factor in children's developmental outcomes. Parental responsiveness reflects a recurring and three-event sequence: a child act, a parent reaction, and the effect on the child in exchanges between child and parent (Bornstein, et al., 1992). Indicators of parental responsiveness include being affectionate and accepting, providing comfort and support, being involved in children's social and academic development, and recognizing children's achievements (Crawley & Spiker, 1983; Guralnick, Neville, Hammond, & Connor, 2007; Padilla-Walker, 2007; Sandberg & Liliedahl, 2008).

Parental responsiveness during parent-child interactions is associated with children's developmental outcomes (Beckwith and Parmalee, 1986; Bornstein & Tamis-LeMonda, 1997; Mahoney, Boyce, Fewell, Spiker, & Wheeden, 1998; Mahoney, Finger, and Powell, 1985). Early responsive parenting and consistent responsiveness from parents has been related to a greater rate of growth in cognitive and social skills (Landry, Smith, Swank, Assel, & Vellet, 2001). Maternal, or parental, responsiveness to infant non-distress vocalizations has been associated with infant attention span and symbolic play competence (Bornstein & Tamis-LeMonda, 1997). Moreover, Kim and Mahoney (2004) found a positive relationship between parental responsiveness and children's engagement during parent-child free play. Ruble et al. (2008) found that degree of parental responsiveness was related to children's initiated communication skills. Siller and Sigman (2008) found that parents who responded to their children's ongoing interests and activities promoted the children's language skills. Additionally, parental

responsiveness with shorter lags was related to a child's self-control, defined as compliance to parental commands and the ability to delay acts on request (Feldman, Greenbaum, & Yirmiya, 1999).

Parent-Child Synchrony

Synchrony is a complex process that reflects how interacting partners adapt to one another's behaviors in order to maintain a coherent and mutually rewarding interpersonal exchange (Barber, Bolitho & Bertrand, 2001; Lindsey, Colwell, Frabutt, Chambers, & MacKinnon-Lewis, 2008). According to a definition by Feldman (2007), "synchrony, as a time-bound experience, offers a unique co-regulatory framework for the perpetual dialogue of self and other, for the coordination of personal timing and shared moments" (p. 346). A synchronous interaction indicates a parent-child dyad's capacity to maintain a mutual and shared focus of attention. To conceptualize and measure parent-child synchrony, researchers have identified several dyadic characteristics. Those characteristics include engagement, affective tone, affect attunement, connectedness, mutuality, shared focus of attention, shared emotion, social contingency, mutual compliance, verbal turn taking, and behavioral reciprocity (Haft & Slade, 1989; Harrist, Pettit, Dodge, & Bates, 1994; Isabella, Belsky, & von Eye, 1989; Lindsey, Cromeens, Colwell, & Caldera, 2009).

Researchers have found that parent-child synchrony is related to a child's development and behaviors (Feldman & Greenbaum, 1997; Feldman, Greenbaum, & Yirmiya, 1999; Kuhn, 2007; Lindsey, Cromeens, Colwell, & Caldera, 2009; Rocissano, Slade, & Lynch, 1987). Greater synchrony was related to greater child social-emotional competence, greater communicative competence, and better self-controlled behaviors (Feldman, Greenbaum, & Yirmiya, 1999; Lindsey, Cromeens, Colwell, & Caldera, 2009). High levels of synchrony were associated with high levels of child compliance and low levels of positive synchrony were associated with child aggression (Rocissano, Slade, & Lynch, 1987). Finally, maternal synchrony and maternal affect attunement were related to a child's engagement in symbolic play (Feldman & Greenbaum, 1997). In early childhood, parent-child synchrony serves key functions, which include: (1) multisensory processing (e.g. young children gather visual or auditory information around them), (2) homeostatic regulation (e.g. parents assist their young children in adapting their sleeping or eating cycles to the external social world), (3) experience of effectance (e.g. parents respond and

provide feedback to children's initiated actions), (4) facilitation of secure attachment (e.g. young children demonstrate positive attachment behaviors if their parents quickly attend to their children, interpret children's expressive cues, and appropriately respond to them), (5) increased communication competence (e.g. children associate words with the references from what they hear of their parents' verbalizations), (6) enhanced autonomy and self-control (e.g. young children practice self-regulatory skills as they learn to comply with parents' wishes), and (7) learning of social skills (e.g. children from high-synchrony dyads integrate more easily into peer play) (Harrist & Waugh, 2002). The synchronous interaction experience serves as a path for children to act independently and to connect emotionally with their parents.

Parent-child synchrony requires mutual involvement with a task. In this context, synchrony generally refers to the capacity of a parent to remain available to his/her child. On the other hand, synchrony also indicates the ability of a child to assume the appropriate role within parent-child social contexts. The involvement of parent-child synchrony changes over time, gradually transitioning from a dependence on parent initiations during infancy to a near-equal and balanced involvement in terms of turn-taking and initiations (Harrist & Waugh, 2002). Parents are responsible for providing stimulating learning environments for their child, though parents should be cautious about their responses to their child and not overly control or disrupt the child's focus.

Parent-child synchrony exhibits different patterns in children with disabilities because of their developmental characteristics. Children with profound multiple disabilities often have difficulty responding to social interactions immediately. Difficulties in changing focus make it more difficult to synchronize parent-child interactions (Wilder, Axelsson, & Granlund, 2004). Similar situations can be found in children with autism. Empirical research has shown that children with autism initiate joint attention (e.g. use a finger to point at something they are interested in) and respond to joint attention requests less frequently than children without disabilities (Gernsbacher, Stevenson, Khandakar, & Goldsmith, 2008). Additionally, children with autism also direct the attention of another person to an object or event by pointing, showing, or alternating their gaze between the object and another person's eyes less frequently than children without disabilities. Maternal synchrony and well-timed social-communicative interactions between mothers and children with autism have an impact on joint attention behaviors (Mundy, 1995). Siller and Sigman (2002) found greater parent-child synchrony was

associated with better joint attention and language skills of children with autism. Regarding children with ADHD, researchers found that higher child cooperation or enthusiasm and higher dyadic synchrony were related to better child functioning, including a child's global development, neuropsychological functioning, and psychosocial functioning (Healey, Gopin, Grossman, Campbell, & Halperin, 2010). They also stated that children exhibited negative responses more frequently when parents made increased demands. Furthermore, Mize and Pettit (1997) found that high levels of parent-child synchrony were related to preschool teachers' ratings of positive child social functioning. The quality of parent-child synchrony, which prolongs parent-child interactions, is an essential element in child development of both typically developing children and children with disabilities or developmental delays.

When interventionists take all of the findings described above into consideration, parent-child synchrony is a promising target for enhancing early intervention efforts, especially for children with autism and their families. In a randomized controlled trial study by Aldred, Green, and Adams (2004), researchers implemented a social communication intervention for children with autism in order to promote the quality of parents' adaptation to and communication with their children. Results indicated that the mean frequency of parent synchrony in the treatment group increased slightly over time, whereas the mean in the comparison group decreased. The increased parent-child synchrony and joint engagement benefited the children with autism in social reciprocity and expressive language. Another randomized controlled trial study indicated that children with autism in the treatment group receiving interpersonal synchrony training exhibited significant increases in socially engaged imitation, though no gains in the initiation of joint attention and shared positive affect (Landa, Holman, O'Neill, & Stuart, 2011). These findings indicate that training in synchronous behaviors can enhance some areas of development for children with disabilities.

Young children enter into the social world through the moment-by-moment adaptation of an attuned and caring adult. Harmonious and supportive interactions allow young children to utilize their communication and social skills to the optimal extent. Interaction synchrony in the context of parent-child play addresses the matching of behaviors, affective states, and mutual involvement between parents and children, who together form a harmonious interaction.

Parent-Child Play Interactions

Parent-child play behaviors have been studied as a means to examine parent-child interactions. Experts in early childhood view play as vital to a child's development and as essential to maintaining strong parent-child bonds (Ginsburg, 2007). Children learn by observing and interacting with their parents. Parent-child play not only entertains children, but also provides parents with opportunities to engage and communicate with their children. Experts in early childhood development have also found that early parent-child play is important to children's cognitive, social-emotional, social competence, and self-regulatory development (Bornstein & Tamis-LeMonda, 1995; Lindsey, Mize, & Pettit, 1997; MacDonald, 1993).

Since children play on a daily basis, parent-child play interactions are crucial to a child's development. Unlike general (non-play) parent-child interactions, play interactions are clearly distinguishable by their emphasis on parents having fun with their children, rather than on the content of the interactions (Tamis-LeMonda, Uzgiris, & Bornstein, 2002). Furthermore, emotional availability and the overall quality of emotional exchanges between parents and their children have been identified as key factors during parent-child play interactions (Biringen & Robinson, 1991; Biringen, 2000; Venuti, de Falco, Giusti, & Bornstein, 2008). Children with disabilities enjoy play as much as other children without disabilities. One mother of a child with disabilities described the playful interaction with her child as "dancing and singing loudly and crazily when they were in private" (Santos & Mccollum, 2007, p. 253). This mother stated that the play allowed her child to express himself.

Researchers have identified typical play characteristics of children with disabilities (Pierce-Jordan & Lifter, 2005; Venuti, de Falco, Esposito, & Bornstein, 2009; Williams, 2003). Children with Down syndrome were found to explore their environment less than children with typical development (Venuti, de Falco, Esposito, & Bornstein, 2009). Children with autism exhibited fewer initiations and responses to shared focus of attention, fewer verbal or physical turn-taking episodes, less social communications, more repetitive play, and less functional toy play (Williams, 2003). Additionally, Pierce-Jordan and Lifter (2005) found that when children confront developmental difficulties or challenges in play, they tend to display fewer social interactions with others; the finding was discovered both in children with and without pervasive developmental disorders (PDDs). Through playing with their parents, young children practice

various skills (e.g. problem solving, social rules, cognitive concepts, and language comprehension). Ultimately, parents are responsible for the quality of their children's play.

Parents of children with disabilities value play as a means to connect and relate to their children (Buchanan, 2009; Childress, 2011). Parental play behaviors are influential to a child's development. When parents play with young children, restricting children by terminating their activities or directing their attention to a new task was found to decrease rates of cognitive-language and social development (Landry, Smith, Miller-Loncar, & Swank, 1997). On the other hand, maintaining children's focus of interest was associated with positive outcomes in children's cognitive-language and social development. Researchers found that children with autism responded best when mothers used physical or toy-related approaches, and they responded less often to social approaches (Doussard-Roosevelt, Joe, Bazhenova, & Porges, 2003). Moreover, Venuti et al. (2009) conducted a study comparing mother-child play behaviors between children with typical development and children with Down syndrome. The findings indicated that young children with Down syndrome spent significantly more time unengaged during play, both in solitary or collaborative play. To provide quality play, parents of children with disabilities need to match their children's interests, behavioral styles, and developmental levels.

The quantity of play is as essential to parent-child play interactions as the quality. Researchers found that mothers played less frequently with their children who had disabilities than mothers of children without disabilities (Santos & Mccollum, 2007). Parents of children with disabilities do, however, commonly engage in daily therapy-related interactions. The combined uses of play interactions (e.g. free play without rules, play just for fun) and intervention-based interactions (e.g. goal-oriented, teaching-based) are both important to the development of children with disabilities (Childress, 2011).

Young children explore social, material, conceptual, and imaginary worlds through play. Exploring, communicating, and interacting with others and the environment through play can sometimes be challenging for children with disabilities. If parents provide support and scaffold their children's play efficiently, children can learn and interact successfully during play activities. Reciprocally balanced parent-child play helps indoctrinate children into the world of mutual accommodation and regulation in a play context. Early intervention can do much to enhance young children's play and promote parent-child interactions.

Early Intervention for Families of Children with Disabilities

Early intervention is the process of providing services and support to families who have children with developmental delays or disabilities. Early intervention services for children with disabilities from birth to three years old have been included in the Individuals with Disabilities Education Act (IDEA) since 1986. In 1997, Public Law 105-17 reauthorized IDEA and revised Part C (from Part H) to require the provision of early intervention services to infants and toddlers with disabilities. Services are designed to intervene at the early stages of disability or delay and to enhance the developmental competence of the children. In general, components of successful early intervention programs can be organized into three categories: resource support, social support, and information and services (Guralnick, 2005). Early intervention provides positive effects on the developmental achievements of children with or at risk for developmental delays. Structured, long-duration, intensive, child-centered early intervention programs appear to optimize program benefits (Majnemer, 1998).

Family-Centered Early Intervention Services

The family-centered approach is one of the core concepts in early intervention services. Family-centered early intervention refers not only to a philosophy of care but also a set of practices (Bruder, 2000). A family-centered approach to early intervention aims to support and strengthen the children and their families. In the 1980s, several scholars argued that professionals should build partnerships with families to empower them rather than to engage in traditional therapist-client relationships (Dunst, 1985; Foster, Berger, & McLean, 1981). More recently, the family-centered approach has evolved to the point where parents involve themselves actively in the decision-making processes to direct the services that they and their children receive. The joint decisions parents can make with the intervention team members include treatment goals, kinds of services, locations of the services, and amount of services. Parents who reported ease in accessing participation in early intervention programs perceived that services were based on individual child and family needs. Parents also felt that they had a role in making key decisions about child and family goals (Bailey, Hebbeler, Scarborough, Spiker, & Mallik, 2004).

Family-centered early intervention services must: consider the complexity that exists within families; be community-based; use strategies that can accommodate diversity in family beliefs, values, and functioning styles; and use flexible intervention strategies that match family

priorities (Johnson, Gallagher, & LaMontagne, 1994). The foci of a family-centered approach include helping families cope with the challenges of having children with disabilities, helping families work collaboratively with service providers, and supporting families as they make decisions about services. Researchers have found that family-centered early interventions can reduce parents' stress and increase their feelings of empowerment (Dunst, 1985; Thompson et al., 1997). In order to empower parents, practitioners do not teach parents exactly what to do, but rather strengthen the skills that they need to complete a variety of intervention tasks independently (Shannon, 2004). Empowered parents take action to get what they want and need for their families. A family service plan is intended to help families develop better coping and problem-solving skills for the complexities of rearing children with disabilities or developmental delays. An early interventionist who works directly with a family plays an integral role in connecting the family with the treatment system and team.

Service providers' optimism, sensitivity, friendliness, and responsiveness provide the path to family-oriented practice (McWilliam, Tocci, & Harbin, 1998). Wadsworth and Wartelle (1994) suggested that interventionists should act with sensitivity and flexibility to the regional, socioeconomic, cultural, and gender issues of each family. Some family-centered service providers have shared valuable experiences regarding their work with families (Rodger, Keen, Braithwaite, & Cook, 2008): (1) providers need to be sensitive and understand families' concerns, needs, and priorities; (2) providers need to think positively about the parents without passing judgment; (3) providers need to respond attentively to parents' concerns; and (4) providers need to build a rapport with parents and treat parents as friends. Researchers also found that families who perceived services as helpful regarded the relationship between service providers and parents to be an important component of early intervention services.

The family-centered approach highlights the importance of providing parents with choices and providing them with options. A family-centered approach also attempts to alleviate parenting burdens when possible. Eiserman, Weber, and McCoun (1995) investigated the effectiveness of the family-centered interventions on the speech and language of children with developmental delays. Results indicated that the home parent-education group performed as well as the clinic-based group. These findings imply that trained parents can do as well for their children as professionals on selected measures of communication. For young children, including children with developmental disabilities or delays, the most essential context for social and

behavioral development is that of the family. Accordingly, family members as intervention agents are encouraged to actively participate in direct intervention and support in home settings (Duda, Clarke, Fox, & Dunlap, 2008).

The movement toward family-centered services intends to support families while they are dealing with circumstances associated with raising, nurturing, and parenting children with disabilities or developmental delays. However, parents need models and mentors so that they are able to transfer learned skills to their children (Thompson, et al., 1997). By enhancing the effectiveness of parents' to promote the development and well-being of their children, data on parent education programs indicate better intervention outcomes for their children (Chiarello & Palisano, 1998; Coolican, Smith, & Bryson, 2010; Green et al., 2010; Janssen, Riksen-Walraven, Dijk, & Ruijsenaars, 2010; Mahoney & Perales, 2005; Mahoney, Boyce, Fewell, Spiker, & Wheeden, 1998; McIntyre, 2008; Stephenson, Martin, & Linfoot, 2005).

Parent Education in Early Intervention

During the early childhood period, parents take responsibility for organizing home and community experiences that influence a child's development. Parents are the key to the development and well-being of their young children for the following reasons: (1) all parents have a special bond or attachment to their children that no one else can replace; (2) parents have greater opportunities to interact with their children and to influence their children's development than any other adult or professional; and (3) children need their parents to guide them along the continuous learning processes that can occur in any situation (Mahoney, 2008). The intention of parent education in early intervention services is to empower parents to assist their children directly on a daily basis. Dinnebeil (1999) defined parent education as a range of activities that are offered to individual families and are designed to address specific learning needs identified by these families themselves.

Parent education programs have been aimed at providing parents of children who have disabilities or developmental delays with the skills and knowledge necessary to alleviate parental stress and to increase the child's learning in the home setting (Donenberg & Baker, 1993). One dominant approach to early intervention is based on positive parent-child interactions for optimal child development. Barnard and Kelly (1990) stated that "parent-child interaction is increasingly recognized as an important focus of early intervention programs, as research has shown that the

interaction between a parent and child is important to optimal child development” (p. 278). For children with disabilities who may not provide clear communication cues, intervention efforts are aimed directly at supporting parent-child interactions by teaching parents how to read a child’s cues and how to provide contingent and responsive caregiving (McCollum & Yates, 1994). Parents and the professionals in the early intervention team attempt to find the strategies that meet each child’s needs.

Early interventionists who engage parents actively in the intervention process use a variety of strategies, including listening, questioning, problem solving, modeling, prompting, and coaching (Hanft, Rush, & Shelden, 2004). Early interventionists can help parents be more attuned to their children’s interests and abilities. In addition, parents frequently, of their own will, request skill-based knowledge and information on their children’s disabilities. Parents receive such information in order to better understand and promote the development of their children, as well as to improve interactions with their child (Finfer, 2007). In Finfer’s (2007) action project, parents learned: to define the problems they encountered; to gather and organize relevant knowledge and data; to analyze the resulting information; and to design an intervention strategy for improving social interaction.

Children with different developmental deficits require varied intervention strategies to improve parent-child interactions. Children’s motor skill levels affect parent-child interactions, particularly for children with physical disabilities. Chiarello and Palisano (1998) examined the effectiveness of home-based physical therapy on mother-child interactions. Besides the center-based intervention all participants received during the study, children and families in the experimental group received weekly home visits for five weeks from a physical therapist. The short-term intervention for the experimental group was focused on interactive motor play activities. Results indicated that mothers could promote physical activity through play while also being sensitive to positive social interactions. Mothers in the experimental group became more directive in controlling their children’s behaviors, and were more positive when interacting with their children than the mothers in the control group.

Therapists have also helped improve parent-child interactions for parents of children with visual impairments. Relying mainly on audio information and tactile contact, children with visual impairments process communication signals based on limited input. Two mothers who have children with congenital deaf-blindness expressed the need for interaction coaching to: better

read their children's communication cues, respond appropriately to their children's communication cues, improve their parent-child interactions, and improve tactile contact with their children (Janssen, Riksen-Walraven, Dijk, & Ruijsenaars, 2010). The mother-child dyads encountered two main difficulties: the mothers' unpredictable initiations confused the children, and the children's communication cues could not be interpreted accurately. This study implies that the appropriate timing of response after initiations is essential to a successful parent-child interaction.

For children with autism, interventionists emphasize parent-child synchrony and parental responsiveness (Aldred, Green, Emsley, & McConachie, 2012; Green et al. (2010). According to existing practice-based services, early interventions focus on educating parents to work with their young children with autism or developmental delays in the key areas of social responsiveness, joint attention skills, early communication skills, and interactive play (Rocha, Schreibman, & Stahmer, 2007; Solomon, Necheles, Ferch, & Bruckan, 2007; Whalen & Schreibman, 2003). In a randomized controlled trial study by Green et al. (2010), parents received communication-focused intervention with their children present. Although the intervention did not reduce the children's symptoms of autism, parental synchrony and child initiations were improved significantly. Mahoney and Perales (2005) conducted a long-term intervention study and provided weekly individual parent-child sessions over a one-year period. The intervention aimed to help parents use responsive teaching strategies to facilitate their children's development. Results indicated significant improvements in both groups of children (with PDDs and developmental disabilities) in their cognition, communication, and social-emotional skills. Additionally, greater improvements in communication and cognition in children with PDDs were associated with greater parental changes in responsiveness.

Parent education has been found to have practical effects on reducing negative parent-child interactions and the behavioral problems of children with disabilities (McIntyre, 2008). Mothers of children with disabilities who received education interacted more frequently and positively with their children than mothers who did not receive education (Mahoney, Boyce, Fewell, Spiker, & Wheeden, 1998; Stephenson, Martin, & Linfoot, 2005). Mothers who received education also reported increased satisfaction with their parenting skills, more social interactions with their children, and less stress (Singh, et al., 2007). In addition, outcomes also indicated that mothers' aggressive behaviors decreased and children's social skills increased. Singh et al.

suggested that parents should be mindful while attending to their children's challenging behaviors. Mindfulness refers to a clear, calm mind that is focused on the present moment in a nonjudgmental way. One parent-education program successfully facilitated an increase in the duration and frequency of interactive engagement between mothers and their children with developmental delays (Girolametto, Verbey, & Tannock, 1994). Parents' improved abilities can ensure and extend the engagement of their children.

Parent education can also serve as a preventive measure to eliminate the negative behaviors of children with disabilities. McIntyre (2008) used a randomized control trial to evaluate a parent-education program for caregivers who have preschool-age children with developmental disabilities. Results indicated that the program was successful in reducing child behavior problems and inappropriate parent-child interactions (e.g. criticism, aggression, or lack of follow through).

Several researchers have attempted to promote better parent-child interactions by increasing maternal sensitivity and responsiveness (Green et al., 2010; Meijssen, et al. 2010; Niccols & Mohamed, 2000). The use of responsive interaction strategies encouraged parents to become more responsive and less dominant and directive during parent-child interactions (Kaiser et al., 1996; Mahoney & Perales, 2003). Responsive interaction strategies tend to result in longer and more balanced turn-taking interactions between parents and children. The intervention was intended to help parents create communication opportunities for their children and to respond appropriately to their children's signals. Parents who actively learned skills in responding sensitively to their children's cues reported better interactions with their children, better problem-solving skills, and more confidence in reading their children's cues than parents without education (Niccols & Mohamed, 2000). Efficient parental communication enables children to become more equal-partners in parent-child interactions by accepting the opportunities offered and utilizing a wide range of communication skills.

As a part of early intervention services, social communication intervention has benefited children and parents by promoting positive interactions and reducing parental control of joint activities. Parents are encouraged to implement the strategies within daily routines (such as playtime) by following their children's lead, allowing their children to initiate, responding contingently to their children, and providing natural consequences to their children's actions. Parents who have received intervention in this approach exhibited increased parental

responsiveness and decreased directive behaviors; children also demonstrated improved social communication skills and increased time spent in interactions with their parents (Kaiser, Hemmeter, Ostrosky, Fischer, Yoder, & Keefer, 1996; Kaiser & Hester, 1997; Stephenson, Martin, & Linfoot, 2005).

Early interventionists are responsible for helping parents transfer and generalize learned skills to a variety of settings. The more skills parents possess, the less help they need to seek from the early interventionists. To optimize education effectiveness, researchers encourage caregivers to apply learned strategies (such as praise, modeling, or imitation) within their child's daily routines. Woods, Kashinath, and Goldstein (2004) trained caregivers to implement naturalistic teaching strategies within a family's preferred play routines, and subsequently investigated caregivers' generalized use of these strategies during other daily routines. Findings indicated caregivers' use of interactive strategies within indoor-play routines increased, but generalization to other settings was limited. Parents reported that they preferred direct assistance from interventionists during interactions with their children, rather than conversations with interventionists (Peterson, Luze, Eshbaugh, Jeon, & Kantz, 2007). To help parents learn interaction skills for everyday practice, it appears that on-site home coaching is essential.

The demand for early intervention services has increased due to increasing numbers of children with developmental delays. For those families who had to wait or were unable to access comprehensive treatment plans, Coolican, Smith, and Bryson (2010) investigated the effect of a less intensive (six-hour) parent education program on the communication skills of preschoolers with autism. Results indicated that children's communication skills (namely functional utterances) increased, and parents' fidelity in treatment implementation also improved after education. Coolican et al. suggested that brief parent education in pivotal responses (i.e. skills children must use to progress in targeted developmental domains) provides an immediate, cost-effective intervention. In addition, one positive outcome of parental empowerment was seen in decreased requests for individual in-home assistance. All participants had previously been on the waiting list for individualized intervention assistance. After participation in the short-term education, the majority of parents subsequently chose consultation as their preferred follow-up service option, stating they no longer required intensive services. Providing short-term parent education to reduce costs to the social service system should be considered during times of fiscal

restraint. Regardless of how parent education is provided, researchers suggest that practitioners go into homes to determine how parents are applying the learned skills (Finfer, 2007).

Music, Young Children, and Families

Musical activities, such as singing, listening, playing instruments, and moving to music, provide natural opportunities for social interactions between children with disabilities and their families. Music can easily facilitate parent-child interactions when both children and parents enjoy making music together. In addition, family involvement in music can promote a bond between children with developmental delays and their families. It would be wise for families of children with developmental delays to take advantage of the diverse functions of music to promote their children's health and development.

Music and Young Children's Communication

Music can serve as a means of communication for young children. Music listening and music making align with the use of receptive and expressive language in communication. Young, Street, and Davies (2007) found that in infancy, music is a medium that can enable and support the development of early communication skills. Young children typically hear children's songs, and later determine what music they would like to hear on their own (Lamont, 2008). By providing various sources of music, parents can encourage their children to express their musical preferences.

Various researchers have stated the importance of singing as a communicative tool for young children and their parents (Custodero, 2006; Honig, 1985; Longhi, 2009). Cohen (1994) described the similarities between speech and singing and noted that "the elements of vocal frequency, frequency range, rate or rhythm, intensity, and diction are essential for the creation of both speech and song" (p. 8). To form a music-friendly environment, music educators created a musical partner (a music-loving bear) in a kindergarten classroom (Southey, 2010). By doing so, children learned to enjoy spontaneous music making and singing in play. For instance, children used pentatonic chime bars to create a song for the bear and sang songs or nursery rhymes to the bear. To extend this musical experience, parents and children were encouraged to engage in creative singing and music making as a form of creative expression.

Music can facilitate emotional bonding between parent and child (de Gratzner, 1999; Nakata & Trehub, 2004; Trehub et al., 1997). Non-verbal communication, such as the communication of emotions, can be delivered and received in songs. Milligan, Atkinson, Trehub, Beniot, and Poulton (2003) classified the maternal attachment of participants as ‘autonomous,’ ‘dismissing,’ or ‘preoccupied.’ Findings indicated that regardless of maternal attachment classification, the mothers’ singing reflected more natural and emotional involvement when infants’ were present than when infants’ were absent. Emotional intentions have been identified in infant-directed speech or singing (Nakata & Trehub, 2004). They found that infants exhibited more sustained attention to maternal singing than to maternal speech. Therefore, infant-directed signing has great potential to promote emotional communication between parents and young children.

Engaging sounds in a song can encourage early vocalization. In addition, children are likely to gain more confidence in talking and singing when they are exposed to a musical-language environment (Honig, 1995). Songs combined with movement and gestures provide opportunities for children to express themselves through both verbal and nonverbal means (Murphy, 2010). Music can provide a vehicle for children to express their thoughts and feelings. Nyland, Ferris, and Dunn (2008) observed young children participating in a music group and found that the children were actively expressing themselves through hand gestures.

The process of music learning is similar to the imitative process of language learning. Valerio and Reynolds (2009) encouraged parents to interpret children’s vocalizations during singing activities. By joining in music activities with their children, parents can collect ideas to extend their musical interactions; this pattern is similar to the form of conversation. Music and language share common features of communication and expression through sound and hierarchical organization. Call-and-response techniques provide opportunities for mutual communication both in music and language. Well-structured musical interactions can be used to form a crucial foundation for young children’s future linguistic interactions.

Singing activities require vocal production which is related to expressive communication. Gromko (2005) provided four months of musical training to kindergarten children. Results indicated that children who received training showed greater phonemic fluency than the children in the group that did not receive training. This finding implies that musical activity is beneficial for children to develop aural skills for spoken sounds and words. Furthermore, Chen-Hafteck

(1997) studied music and language development in terms of young children's early perceptions of sounds, pre-musical and pre-linguistic vocalizations, and the emergence of singing and speech. Chen-Hafteck suggested that the combination of music and language enhances children's learning. Children who were involved in an expressive language and music project made noticeable gains in language, musical, and social skills (Gan & Chong, 1998).

Vocalizations are essential to children's emerging speech. By singing songs, children can explore inflection or tone color, rhythmic speech, or simple vocalizations (Tarnowski, 1999). Musical improvisation provides an artistic venue for self-expression and promotes the child's creative thinking via musical flexibility, originality, and syntax of music-making (Koutsoupidou & Hargreaves, 2009). Improvised singing allows for errorless sound-making. Young (2006, 2008) investigated vocalizations and improvised singing within the context of free play. She proposed five categories for singing play: (1) chanting and intoning, (2) free-flow vocalizing, (3) reworking of known songs, (4) movement vocalizing, and (5) vocalizing to animate.

Functional musical play includes vocal, instrumental, and environmental-sounds exploration. It allows children to explore, create, and improvise with sound (Littleton, 1991). Music activities that interest young children motivate them to pay attention, listen attentively, participate actively, and respond both verbally and physically. Skills young children acquire in music, such as auditory awareness and discrimination, can benefit language development. Music allows for imitative and spontaneous language in children during the pre-verbal stage (Tarnowski, 1999).

Music and Families of Young Children

Custodero, Britto, and Brooks-Gunn (2003) found that music activities are often used in home environments with young children on a daily basis. A survey study involving over 2000 families with children from birth to age three indicated that 60% of the parents sing or play music for their children daily, and an additional 32% of the respondents reported participating in singing or playing with their children weekly. By singing, playing, and moving to music, parents share an intimate experience with their children. A number of researchers have found that music participation can bond families together and improve the quality of family time (Custodero & Johnson-Green, 2008; de Vries, 2009; Ilari, 2005; Vlismas & Bowes, 1999; Young, 2008). Fox (2000) encouraged parents and caregivers to involve children in active and expressive types of

music making, including singing, moving-to-music, and instrumental playing. A study about kindergarten children's interest in music activities at home indicated that children expressed more interest in the activities of listening to music, dancing and moving to music, and singing songs, whereas they expressed less interest in the activities of playing instruments and creating music (Denac, 2008). Lamont (2008) found that young children commonly listen to children's music, including nursery rhymes, school songs, Disney and other children's films, and children's television programs.

Researchers have indicated that parents use music primarily as a means to socialize, to soothe, or to distract their children (Custodero & Johnson-Green, 2008; Gudmundsottir & Gudmundsdottir, 2010; Neelly, 2001; Young, 2008). Mothers also reported using music for relaxing, calming, and entertaining their children in the car or at home (Vlismas & Bowes, 2010). In addition, music facilitates the bonding of parents and their children. Mothers reported that music assisted them in bonding with their babies by playing and learning together. De Gratzer (1999) found that when parents and children attended music activities together, the musical engagement not only resulted in greater communication between parents and children but also strengthened their relationship.

Multiple media resources are typically found in the homes of economically privileged children (Young, 2008). Equipment such as TVs, musical toys, ipods, and CD players are often used on a daily basis. As opposed to occupying children with musical products, de Vries (2007) encouraged parents to actively engage with their children when they listen to music. Live music making benefits young children more than music listening (Young, 2008).

Singing has been identified as the primary musical activity of mother-infant dyads (Ilari, 2005). Singing to children is beneficial for regulating infants' states and communicating emotional information (Rock, Trainor, & Addison, 1999; Trehub et al., 1997). Furthermore, singing is commonly used in families as their bedtime ritual. The ritual of singing to end the day calms and comforts both parents and children (Custodero, 2006). When parents sing to their infants, affection and love are conveyed naturally through the songs (Trehub et al., 1997). This finding holds true when parents sing to their children, regardless of whether they are mothers or fathers, musically trained or untrained, experienced or inexperienced in child care, or whether the child is familiar or unfamiliar with the language and culture of the singers (Trehub et al., 1997).

Parents who sing to their children provide a vocal model for their children. When singing to infants, mothers frequently use certain acoustic properties, such as a high pitch level, glides between pitch levels, slow tempo, and sustained vowels (Bergeson & Trehub, 2002; Trainor, Clark, Huntley, & Adams, 1997; Trehub, Unyk, & Trainor, 1993). Mothers modify these elements in order to match or alter the infant's state. Playful maternal singing facilitates the infant's arousal state to an optimal level (Shenfield, Trehub, & Makata, 2003). Singing allows for spontaneous vocal play between parent and child. Custodero (2006) worked with ten families to use singing within their daily routines. The families used singing to maintain family traditions and to create new traditions. Additionally, the parents were able to modify songs their own parents used to fit the needs of their family.

De l'Etoile (2006) found that live, infant-directed singing and modifying songs based on infants' behaviors or behavioral states allowed for positive parent-child interactions. She also found that listening to infant-directed singing was more beneficial in sustaining infant attention than listening to recorded music. Other researchers have found that infants listened more attentively to singing in an infant-directed style than to other styles of singing (Masataka, 1999; Trainor, 1996). Longhi (2009) explained in another infant-directed singing study that the hierarchical organization of songs provided a framework for the musical interaction. Infants displayed synchronous behaviors at the beginning, middle, or end of phrases. She encouraged mothers to utilize verbal and non-verbal communication means to help infants process sensory information and to facilitate infants' participation in musical interactions. Longhi stated that singing interactions support turn-taking and the contingency of parent-child interactions, and thus facilitate attunement and bonding between parents and infants.

Musical play involves vocalization, rhythmic movement of body or objects, or instrumental playing. Addessi (2009) encouraged parents to create a stimulating space during musical free play, and to make them available to their child in order to increase the child's vocal inventions. Vlismas and Bowes (1999) encouraged first-time mothers to combine music and movement to play with their infants. Parents' active participation during musical play is particularly essential for children during the pre-verbal stage or for children with developmental delays. During musical play, children respond naturally to music, lyrics, and rhythms. Experts have suggested that children's musical play is improved when adults refrain from correcting

children's nontraditional playing and value children's musical play through descriptive and encouraging comments (Berger & Cooper, 2003).

Parents of children with disabilities or delays have reported that they involve their children in musical activities at home (Yang, 2011). This investigation also revealed that singing activities were conducted in the home more frequently than moving to music, music listening, and instrumental playing activities. Although music activities seem prevalent in families of children with disabilities or delays according to the investigation outcomes, parents stated that they would like to learn how to use music to interact more with their children and to assist in their children's development, especially the development of their children's communication skills (Yang, 2011).

Music Therapy Programs and Music Groups for Parents and Young Children

Music therapists and music educators have advocated the benefits of music experiences during early childhood. Parental involvement is critical to greater musical engagement and the quality of child care for young children. The joint participation of parents and young children in music provides a fun and shared experience through singing, listening, movement, and instrumental playing. Several music programs with long histories have been established in various communities.

In the 1970s, Daniel Pratt adapted an early childhood music program created in Germany and offered the first *Kindermusik* teacher education in the United States. *Kindermusik* has been provided in more than 70 countries for over 1.5 million families (<http://www.kindermusik.com/about>). This music and movement program involves parents and young children in musical play. *Kindermusik* advocates that parents are young children's best teachers. The home materials provided extend the learning experiences into children's daily lives.

In 1987, Kenneth Guilmartin, in collaboration with Lili Levinowitz, first offered the music program *Music Together* to young children and their families in the United States (<http://www.musictogether.com/AboutUs>). *Music Together* was designed to provide a music-rich and developmental-appropriate environment for training young children's tonal and rhythmic abilities. One philosophy of this program is active participation of parents or caregivers during

music time. This program encourages parents to create spontaneous musical activities for their children in their daily lives.

Anne Meeker Miller (2006) created the *Baby Sing & Sign* program and incorporated signs into music to facilitate infants' communication and strengthen the adult-infant bond. *Baby Sing & Sign* teaches parents to use signs with their children during the pre-verbal stage, and thus enable the children to communicate their needs. Although these music programs described above are primarily designed for typical developing children, authors have encouraged music therapists to adapt these activities to work with young children who have developmental delays or disabilities (Miller, 2006; Pasiali, de L'Etoile, & Tandy, 2004).

Since family-centered care is considered the ideal standard in early intervention services, the importance of family-centered music therapy has also been recognized over the last two decades. Working in partnership with parents enriches the benefits of music therapy interventions. In order to form an effective team, music therapists should discuss what roles parents would like to play and what goals parents would like to pursue with the music therapist (Oldfield, 2008). Musical play can set the tone for playful interactions between parents and children with disabilities.

The interactive context of music activities creates opportunities for a music therapist to work with parents on developing skills that promote parent-child interactions. Music therapy has been used to assist parent-child bonding between traumatized children and their new adoptive parents, to promote attachment between mothers and young children, and to facilitate parent-child interactions between parents and young children with or without disabilities (Cunningham, 2011; Drake, 2011; Harris, 2001; Nicholson, Berthelsen, Abad, Williams, & Bradley, 2008; O'Callaghan & Jordan, 2011; Pasiali, 2010; Shoemark, 1996; Walworth, 2009; Whipple, 2000; Wylie, 2004). The purposes of these music therapy interventions have been to: teach positive parenting skills, teach the appropriate use of music-related materials, teach parents ways to reduce stress while caring for their children, and create opportunities for parents to experience musical connectedness with their children. Interactive strategies used in music activities, such as sharing instruments and taking turns while playing with instruments or props, have been found to strengthen parent-child intimacy and interactions (Hibben, 1992; Pasiali, 2010).

Researchers have found that participation in music programs can result in parents' reduced irritability, increased confidence, increased sensitivity toward their children, increased

engagement with their children, and improved mental health (Harris, 2001; Nicholson, Berthelsen, Abad, Williams, & Bradley, 2008; Walworth, 2009). In addition, Whipple (2000) found that parents who received intervention used music more appropriately during parent-child interactions and spent more time with their children than parents who did not receive intervention. Positive outcomes were found not only for parents, but also for their children's communication and play skills.

Intervention can improve parents' attitudes toward the use of music with their children. For instance, after a parent-infant music course, mothers noted that such music experiences were important for their children (Gudmundsottir & Gudmundsdottir, 2010). Parents also reported the value of program participation by requesting audio recordings and lyrics books which they used to practice the learned songs with their children (Shoemark, 1996). Harris (2001) found that the degree of program participation affected intervention outcomes. She found that parents who participated actively in a program tended to interact more appropriately with their children.

Parent-child joint music therapy sessions allow parents to practice parenting skills with the therapist. Under the supervision of the music therapist, one mother matched her son's high energy level as he moved from one instrument to another, and stayed calm and firm when her son exhibited challenging behaviors (Oldfield, 2008, p.19-36). The mother recalled that she let the interactions within music-making experiences shape and determine the way she and her son related to each other. When working in collaboration with a parent-child dyad, a music therapist can act like either a participant or an observer depending on the dynamics of parent-child interactions.

Music has been used to help parents who suffer from depression. Pasiali (2010) provided music therapy interventions to support and enhance positive mutual interactions between parents with a history of depression and their children. Those interventions elicited parents' awareness of ways to support their children and to change problematic interactions. Results indicated that the participants exhibited increased harmonious communication, joint engagement, and reciprocal play interactions during the music therapy sessions. Music can provide a supportive environment that allows parent-child dyads to rehearse adaptive and resilient ways of interacting, bonding, and playing together. For parents who are depressed or who experience stress while taking care of their children with disabilities, musical participation can help them to relax, and can help to improve their mood.

Music therapists in Australia instituted a longitudinal intervention to young children under three years of age and their families to promote positive parenting and child development. Researchers in collaboration with music therapists conducted this nationwide clinical project and a series of research studies (Abad & Edwards, 2004; Abad & Williams, 2007; Nicholson, Berthelsen, Abad, Williams, & Bradley, 2008; Nicholson, Berthelsen, Williams, & Abad, 2010). Three thousand parent-child dyads attended this music program over a four-year period, and more than 1,000 parent-child dyads participated in the studies. The target families included parents of children with disabilities, young parents, families facing general social and economic disadvantages, Indigenous families, and non-Australian born or refugee families. In the music-based parenting education program *Sing & Grow*, music therapists used non-didactic behavioral strategies (i.e., demonstration, rehearsal, feedback, and praise) with musical activities in order to promote parenting skills and increase parents' self-confidence. According to parent reports, over half of the parents perceived that their children's developments were improved, and three-fourths of the parents stated that they learned new ways of playing with their children. Overall clinician reports indicated that parenting behaviors and child behaviors were improved at post-intervention compared to pre-intervention.

Music-based interventions can elicit children's responses during musical interactions. Wylie (2004) designed a music program emphasizing musical interactions for infants, toddlers, and their parents. Participating children developed social, vocal, and movement responses during the music sessions. Wylie reported a positive outcome of program participation was that children taught their parents to be more playful and to be open-minded to new ideas or responses to music.

Musical play allows young children and parents to engage in errorless play experiences and in mutually pleasant and reciprocal play. Moreover, music can facilitate parental responsiveness toward their children. Walworth (2009) utilized music therapy interventions to promote young children's developmental responses and parental responsiveness. Results indicated that children who participated in the music group demonstrated more social play behaviors during parent-child interactions than those children who did not participate. Additionally, parents who attended the music group engaged with their children more positively and less negatively than parents who did not attend the music group. Herndon (2010) investigated parents' use of the program activities at home. She surveyed parents in the

Walworth study to determine their application of the music activities with their children in the home environment. Parents reported that they used activities that teach social skills (such as greeting songs and transitional songs) most frequently, followed by songs for affection and parent-child bonding.

Music therapy interventions have the potential to improve parent-child relationships as well as relationships between siblings. Shoemark (1996) incorporated music therapy into a family-centered play group designed to aid children with developmental delays and their families. The goals of the collaborative group were to facilitate creative expression in each family member and to facilitate mutual enjoyment of family members. Findings indicated that the group provided positive family-sharing time and experiences through music.

Active and interactive participation of musical activities has been recognized as beneficial for children with autism and their families (Allgood, 2005). Allgood examined the effectiveness of a 7-week family-based music therapy group for four children with autism and their families. Parents reported the music therapy activities became part of their family routines, and that the families enjoyed the shared musical experiences. One parent reported that a sibling's participation was the highlight of the musical experience, that the musical activities allowed other family members to view the child with a disability more positively.

If properly structured, musical play can provide a multi-sensory and stimulating environment for young children. Vlismas and Bowes (1999) incorporated relaxation methods, kinesics, songs, visual and tactile stimulation in a music program for first-time mothers and their infants. One major outcome of the program was mothers' increased repertoire of music and movement activities suitable for their young children. Some mothers reported that the music program assisted them in bonding with their children through sharing time together; other mothers noted that the program motivated them to take better care of their children; and a few mothers stated that participating in the group had been relaxing.

Wellness programs in music therapy have extended the benefits of music participation to families without children who have diagnosed or overt additional needs. Mackenzie and Hamlett (2005) provided music therapy for families with typically developing young children. Mackenzie and Hamlett established a community-based music therapy program, *Music Together*, which has operated in Australia since 1999. Over 90% of parents perceived that this program enhanced parent-child interactions both within sessions and at home. After program participation, some

parents developed new parenting strategies to use at home, such as singing to distract, entertain, soothe, and change the mood of their children. Furthermore, this community-based program built a social support network between families. *Music Together* creates an inclusive music environment for all children, and utilizes music therapy as a preventative intervention to reduce parental stress and parenting burdens.

The programs described above have documented the benefits of musical participation for families of children with disabilities or developmental delays and have provided support for the potential use of music therapy as an early parenting intervention. To better serve families of children with disabilities or developmental delays, music-based intervention programs need to match a family's lifestyle and interaction style. Parents of children with disabilities or delays need to be educated, equipped, and empowered to assist in their children's development. Music-based education programs that parents can use at home have the potential to promote parent-child interactions, and to be an option in early intervention services for parents who seek assistance.

Rationale and Purpose of Study

Although the benefits of music activities for children and their families have been reported in various studies (Allgood, 2005; Custodero & Johnson-Green, 2008; de Vries, 2009; Ilari, 2005; Shoemark, 1996; Vlismas & Bowes, 1999; Young, 2008), the uses of music for children with typical development might not be fully applicable to children with disabilities or delays. Without enough knowledge or skills, parents of young children with disabilities may unintentionally implement music activities or apply intervention strategies beyond their child's developmental capacities. In addition, the inclusion of music therapists in the family-centered early intervention team is needed in order to benefit parents and children who do not have access to community music-based education programs. Lack of access to these community programs is often due to parents' limited income, parents' childcare responsibilities at home, or parents' lack of transportation. In the music therapy literature, no studies could be found that examined the effect of a home-based, early intervention parent-education program on parent-child interactions and synchrony. In addition, little research exists investigating the effect of music programs designed specifically for parents of children with disabilities and developmental delays.

Music therapy research incorporating family-centered approaches is underrepresented in the early intervention literature. Unlike other home-based early intervention services, such as physical therapy, occupation therapy, and speech therapy, music therapy is not typically delivered in the natural environment. Consequently, the practical matter of how to incorporate music into children's daily routines at home has not been commonly addressed in the research literature for children with disabilities or developmental delays. Music therapy interventions have commonly been carried out with groups in community settings. The social support found between families of children with disabilities or developmental delays and reported in such studies is valuable; however, the quality of service and individualized care found in home-based interventions is worthy of further study, particularly in the field of music therapy.

Several researchers had examined the benefits of music interventions on parent-child interactions (Cunningham, 2011; Drake, 2011; Harris, 2001; Nicholson, Berthelsen, Abad, Williams, & Bradley, 2008; O'Callaghan & Jordan, 2011; Pasiali, 2010; Shoemark, 1996; Walworth, 2009; Whipple, 2000; Wylie, 2004); however, no literature was found documenting the effects of musical participation on parent-child synchrony. The related literature indicates that synchronous and mutually responsive parent-child interactions are important in promoting children's optimal development, particularly for children with disabilities or developmental delays. Nonetheless, it is unknown whether musical engagement can facilitate parent-child synchronous behaviors. Therefore, the purposes of this study were: (1) to investigate the effect of program participation on parent-child interactions during free play, (2) to investigate the effect of program participation on parent-child synchrony during free play, (3) to investigate the parents' perceptions regarding the benefits of program participation, and (4) to examine the parents' use of education materials within their children's daily routines.

Research Questions

1. What is the effect of program participation on parents' positive physical and verbal responses during parent-child interactions?
2. What is the effect of program participation on children's positive physical and verbal initiations during parent-child interactions?
3. What is the effect of program participation on parent-child synchrony during parent-child interactions?

4. What is the effect of program participation on parents' perceived music abilities and degree of comfort using music to interact with their children?
5. What is the effect of program participation on parents' perceptions of their parent-child interaction characteristics during play?
6. What is the effect of program participation on parents' time spent in musical and non-musical play with their children?
7. What is the effect of program participation on parents' uses of musical activities (singing, playing instruments, moving to music, and listening to music) with their children?
8. What do parents perceive to be the benefits of program participation?
9. What do parents perceive to be the most beneficial responsive teaching strategy learned during the parent education program?
10. What do parents perceive to be the most beneficial musical activity learned during the parent education program?
11. What generalizations are parents able to make from the parent education program to their children's daily routines?
12. Do parents continue to use the musical activities and program materials after completion of the study?

CHAPTER THREE

METHOD

The investigator utilized a within-subject group design to assess the effects of participation in a home-based parent education program on parent-child interactions and parent's use of music with children who have developmental disabilities or delays. This chapter includes the method of recruiting participants, a description of the music-based education program, intervention procedures, music therapy session formats, and the dependent measures.

Participants

Participants were parent-child dyads recruited through two state's Part C providers. To be eligible for participation in Part C early intervention programs, parents must have at least one child younger than three years and older than one year of age who has been identified as having developmental disabilities or delays, or who has previously received early intervention services. To determine eligibility for the intervention services, children are administered a standardized developmental test, the *Battelle Developmental Inventory* (2nd ed.), by the early intervention team. Those children whose scores are one-and-one-half standard deviations below the norm in two development domains or two standard deviations below the norm in one development domain are eligible for services. Children who have a documented medical condition that would likely result in developmental delays are also eligible for the agency's services.

Twenty-seven families met the eligibility criteria and consented to participate in the study. One family withdrew during the intervention period due to the mother's medical condition resulting in an attrition rate of 3.7%. Twenty-six families completed the music-based education program. Twenty-six mother-child dyads ($N = 26$) completed the education sessions and assessments. Two fathers also participated in the sessions. The mean age of mother-participants was 34.38 ($SD = 7.73$), and the mean age of child-participants was 2.33 ($SD = 0.61$). The age of the children ranged from 15 to 36 months old. According to parents' and therapists' reports, child-participants' diagnoses included: autism, hearing loss, cerebral palsy, Down syndrome, Williams syndrome, speech delays, and global developmental delays.

Demographic Data

Table 1
Demographic Information for Parents and Their Children (N = 26)

Demographic Variables		N	%
Children			
	Male	20	77%
	Female	6	23%
	White	15	57%
	Black	6	23%
	Hispanic	2	8%
	Mixed, or others	3	12%
Children's diagnosis or developmental concerns			
	Autism	12	46%
	Intellectual disability or global developmental delays	6	23%
	Language delays	5	19%
	Hearing impairments	2	8%
	Motor impairments	1	4%
Mother's employment			
	Stay-at-home mom	11	42%
	Work full-time	9	35%
	Work part-time	6	23%
Mother's highest level of education			
	Middle school	0	0%
	High school	12	46%
	Associate degree	4	15%
	Bachelor	8	31%
	Master	1	4%
	PhD/JD/MD	1	4%
Father's highest level of education			
	Middle school	1	4%
	High school	10	38%
	Associate degree	5	19%
	Bachelor	5	19%
	Master	3	12%
	PhD/JD/MD	2	8%
Family's annual income			
	\$0-\$20,000	3	12%
	\$21,000-\$40,000	10	38%
	\$41,000-\$60,000	5	19%
	\$61,000-\$80,000	3	12%
	\$81,000-\$100,000 or higher	5	19%

Demographic data for parent-child dyads were obtained from one of the pretest measures, the *Parental Use of Music and Play (PUMP)* questionnaire. The requested demographic information included the ages of the mother and child, the child's gender and ethnicity, the mother's employment, the parent's highest level of education, and the family's annual income. Over three fourths of the child-participants were boys. The complete participant data are reported in Table 1.

Research Design

A pretest-posttest within-subject single group design was used in this study. The independent variable was the music therapy interventions with parents and their children. The dependent measures used for assessing parent-child interactions included observations of parents' positive physical and verbal responses, children's positive physical and verbal initiations, and parent-child synchronous behaviors. Also assessed were parents' perceptions of the effect education had on their music skills and their parent-child interactions. All parent-child dyads participated in the six-week home-based music therapy program, and were videotaped during ten minutes of free-play to assess parent-child interactions prior to and following their participation in the program. All parent-participants were administered a *Parental Use of Music and Play Questionnaire* as a pre- and post-intervention measure (see Appendix A). Parents also documented their use of the education materials during the six-week intervention period, and completed a feedback form at the completion of the study.

Materials

The materials used during the music therapy sessions were a guitar, shakers, tambourines, triangles, castanets, jingle bells, a cabasa, a guiro, lollipop drums, sound boards, stuffed animals, scarves, a toy microphone, a baton, a set of picture cards, and an iPod player connected to external speakers. Education materials for each session (a lyrics sheet, a responsive teaching strategy handout, a CD, and an activity-log recording sheet) were provided to the parents. An instrument package that included a hand drum, two shakers, a castanet, rhythm sticks, a tambourine, and a scarf was also given to the parent-participants to use at home. A Sony digital video camera was used to videotape all education and assessment sessions.

Settings

The music therapy sessions took place in all of the participants' homes. Parent-child dyads participated in the sessions together. Other family members, such as siblings or grandparents, were invited to join the sessions as appropriate. The music therapist and the parents normally sat on the floor in order to approximate the children's eye level. When child-participants walked or danced around the house during movement activities, their parents and the music therapist followed them.

The Music-Based Parent Education Program

The investigator designed a six-session parent education program, *Musical Bonds*, based on parents' needs, concerns, musical abilities, and education as determined by a needs assessment survey (Yang, 2011) and the related literature found in chapter two. The parent education focused on promoting parental responsiveness during parent-child interactions. The responsive teaching strategies, adapted from Mahoney and MacDonald (2007), were incorporated into the education program and were taught within the musical contexts of the sessions.

Musical Bonds is an education program of interactive music activities for young children and their parents. The purpose of the music activities—singing, listening to music, playing instruments, and moving to music—is to facilitate parent-child interactions during musical play. All songs and music were original compositions and were created for the purposes of this study. Included in the program are eleven singing activities, eleven musical games, eight instrumental playing activities, six dance and movement activities, and three relaxation activities.

The purpose of incorporating Mahoney's and MacDonald's strategies in *Musical Bonds* is to promote parents' responsiveness to their child, which in turn promotes the child's development. Child orientation is at the core of parental responsiveness. Responsive parents focus primarily on supporting and encouraging their children to participate in interactive activities. According to Mahoney and McDonald (2007), the five dimensions of parental responsiveness are: use of affect, behavioral and developmental matching, reciprocity, shared control, and contingency.

Affect refers to the use of animated facial expressions, expressive gestures or body language, and the dynamic use of vocal tonality during interactions. Use of such nonverbal

behaviors provides important social cues for children. Music can also be used as a form of nonverbal communication. By acting out the different characters in a song, singing expressively, or playing instruments with dynamic or rhythmic changes, parents can easily integrate the use of facial and bodily expressions during musical play.

Match in parent-child interactions means that parents adjust their behaviors according to their children's developmental levels, interests, and behavior styles. Synchrony is the goal of matched parent-child interactions. Parents are encouraged to enter their child's world, and to follow their child's attention as they both engage in new experiences. Musical engagement provides a variety of opportunities for children to explore their interests, to react to various stimuli, and to demonstrate developmental skills that parents can then match.

Reciprocity refers to balanced and back-and-forth engagement in parent-child interactions. Both the parent and child should be responsible for offering an idea or initiating an act while responding to the other during interactions. The application of reciprocity in musical play includes the parent and child singing call and response songs, or the parent holding an instrument while the child plays. In reciprocal play, the parent and child contribute similar efforts and assume similar responsibilities.

Shared control relates to parents' degree of directiveness. Healthy parent-child interactions consist of supportive parental guidance and shared control. Children need to learn to express their needs to others and to control their surrounding environments, though not obsessively. During musical play, the parent and child are encouraged to alternate taking the lead. Taking the lead might include determining the next activity, what instrument to play, or how many times an activity is repeated.

Contingency refers to parental behaviors that are directly related to child behaviors. The timing of parents' responsive behaviors is crucial. A parents' contingent response must occur immediately after the child's behavior. Parents are responsible for understanding the relationship between the stimulus and their children's behaviors. Parents also need to understand the intentions of their child's behaviors in order to respond appropriately. During musical play, children might react positively or negatively toward the musical stimulus, and parents should respond appropriately.

The overall purposes of the *Music-Based Parent Education Program* were to teach parents how to: (1) conduct musical play (singing, listening to music, playing instruments, and

moving to music), (2) show animated facial expressions and change their tone of voice dynamically during play, (3) match their children's interests, behavioral styles, and developmental levels during play, (4) play interactively with their children, (5) limit the number of times they direct their children and to wait for their children to initiate an act, and (6) interpret the intentions of their children's acts correctly and to respond to their children promptly and frequently.

Procedures

To obtain participants, Early Steps staff sent invitation letters and emails to parents of children with disabilities or to parents of children who were receiving early intervention services due to developmental delays. Parents who wished to participate in the education program contacted their service coordinators or therapists. The coordinators or therapists then referred the families to the investigator.

The parents were informed of the goals of the program during their first meeting with the researcher. Parents were asked to sign a consent form. Additionally, parents completed the PUMP questionnaire before the beginning of the six-week parent education program, *Musical Bonds*. All education sessions were carried out in the homes of the parent-child dyads. Although Patterson and Chamberlain (1994) recommended eight to 20 sessions for successful parent education; however, to maintain a high parent participation rate, Cummings (2000) considered six weeks an appropriate length for parent education.

All six parent-education sessions consisted of the same format. Each 40-minute session included a 30-minute music intervention and 5-minute introduction and closing periods. The introduction and closing periods were used to distribute and explain the parent education materials for the week, or to respond to questions. If other family members were present during the sessions, they were invited to participate in the sessions as appropriate. Songs and music activities used in the program are provided in Appendix B.

Parents were encouraged to apply the techniques learned during the education sessions to their children's daily routines. Additionally, parent-participants were asked to play with their children using the education materials at least three times during the week. Parents were instructed to keep activity logs and to record how they applied the musical play and parental

responsive techniques learned during the weekly music therapy session to their children's daily routines. At least three activity logs per week were requested.

At the conclusion of the sixth session, parent-child dyads were again videotaped during 10 minutes of free-play to assess their interactions following participation in the program. In addition, parents were administered the PUMP questionnaire again as a posttest. Parent-child dyads who completed the six-week education program and completed the pre- and post-intervention PUMP questionnaires were allowed to keep the package of instruments along with the education materials (CD and handouts) and were given a ten-dollar gift card as an incentive for study enrollment and completion.

The Music Therapy Session Format

All sessions were held in participants' homes and were provided by a board-certified music therapist. Parent-child dyads and the music therapist were seated on the floor of living room. Prior to the session, the music therapist greeted the parent and child and asked about their lives or issues related to their use of the education materials during the past week. Approximately six to seven activities (songs) were used during each session. The session consisted of singing songs, playing instruments, listening games, and moving or relaxing to music. The procedures for each session essentially followed the same structured session plan, which also served as parents' instructions for using music at home (see Appendix B). The sequence of the activities varied depending on the parents' or children's interests. Generally, the music therapist and the parents followed the children's lead when they requested or initiated a new activity. If siblings or other family members also participated in the session, they were also given opportunities to make requests.

The session started with a theme song. Parent-child dyads sang the theme song and added motions with the music therapist. Young children with no speech were encouraged to move, clap, or play an instrument with the song. Other singing songs were "Animal Song," "Clap Your Hands," "What Do You Like," "Let's Do It Together," "Let's Go Travel," "Let's Move," "Choo Choo Train," and "I See, You See." The singing and instrumental playing styles of the music therapist were playful. The music therapist modeled creative uses of the songs, instruments, and props, but would adapt the musical play based on the parent-child dyads' reactions. The music therapist and the participants sang with guitar accompaniment or a recorded CD. To extend the

singing activities, the music therapist showed parents how to substitute new lyrics, fill in words, and add motions based on their or their children's interests. The closing song "Sweet Baby" or "Baby, I Love You" was sung at the end of every session. The closing song allowed parents to express warmth and affection to their children. Parents either held or put their children on their laps while singing the song to them.

Musical games incorporated a variety of musical elements, including pauses, and changes in tempo, dynamics and style. The music therapist used gestures, such as putting her finger to her ear to cue listening, and animated facial expressions to cue when music elements changed. Parent-child dyads vocalized, played, or moved to the music accordingly. The music therapist instructed parents to follow the child's lead and to mirror the child's vocalizations or acts. Parents and the therapist sometimes served as models for the child. Concepts of auditory awareness and discrimination were embedded into the musical games. A "Stop-and-Go Game" was used in all sessions, though the therapist incorporated or asked parents to incorporate variations of the game in the sessions.

During instrumental playing activities, the music therapist provided frequent opportunities for children to select the instruments they would like to play. The music for instrumental playing consisted of a variety of simple rhythms. The accuracy of rhythm replications was not the primary goal of the education program; therefore, the therapist encouraged parent-child dyads to play freely with their preferred instruments as long as they engaged in the activity. Parents were encouraged to pay attention to the rhythms in order to recognize the different rhythmic patterns used, and if their child repeated the patterns as modeled.

The music for movement activities consisted of two styles, waltz and march. The participants moved their bodies freely or used props (e.g. scarves, batons) to move with the music. All participants marched around the house during the marching activities. Parents and children alternated holding the baton, which represented the leader role. Parents and children also played drums or other instruments with the marching songs. The music therapist instructed the parents to follow their child's lead, to imitate their child's movements, or to hold hands with their child. The relaxation music played at the end of sessions served as a cue that musical play was concluding. The therapist, parents, and children picked up the instruments and props together and put them away during this time.

During the initial session, only music activities were introduced in order to orient the parents and children to musical play. During the following five sessions, the music therapist incorporated the responsive teaching strategies into the various musical activities. The therapist also taught the parents how to interpret their children's intentions and interactive behaviors in relation to the musical activities. The therapist welcomed parents' and children's creative ideas and input.

Parent Education Session Evaluation

All parent education sessions were videotaped to monitor the investigator's interventions and parents' progress. The investigator reviewed the videos after each session. The criteria for parents' progress were based on the objectives set for each education session (see Appendix C). The investigator observed and recorded both parents' and children's behaviors. Session evaluations were taken into account when planning subsequent sessions. If parents did not achieve 80% of the criteria, the investigator would spend some time reviewing the same materials with the parents during the following session.

Data Collection

Parental Use of Music and Play (PUMP). Parent-participants were administered the *PUMP* questionnaire prior to and following the 6-week parent education program. The questionnaire consisted of 20 items related to parents' perceived: music abilities, degree of comfort using music with their children, and parent-child interaction characteristics. Parents rated each of the statements on a 5-point Likert type scale. In addition, parents reported the average time spent daily in musical and non-musical play with their children. Parents also reported on their use of musical activities in the home—listening to music, singing songs, playing instruments, and moving to music.

Activity log. Parents recorded the types, frequencies, and durations of musical activities used with their children. Additionally, parents wrote about how they applied the activities or responsive techniques to their children's daily routines.

Feedback sheet. At the completion of the program, parents reported on the perceived benefits of participating in the education program, the helpfulness of strategies learned during the

education program, and the usefulness of the music activities in assisting parent-child interactions.

Parent-child interactive behaviors. Parent-child dyads were asked to engage in 10 minutes of free-play as a pretest and posttest. The play assessment utilized developmentally appropriate materials, such as puppets, farm animals, bubbles, a baby doll set, a train, stacking cups, cars and trucks, balls, and a bowling set. Toys were set out on the floor in a semi-circle. The parents were instructed to play with their children for ten minutes and to interact with them as they would normally. Parents were asked to conduct at least three different activities with their children. These free play sessions were videotaped, and the sessions observed in order to assess participants' parent-child interactions.

The coding definitions applied to participants' parent-child interactions were adapted from the related literature (Colgan, Lanter, McComish, Watson, Crais, & Baranek, 2006; Stephenson, Martin, & Linfoot, 2005; Wetherby & Prizant, 1993). As with the present study, purposes of the interventions used in the literature were to promote play-based interactions between parents and their children, to increase parental responsiveness, and to increase parent-child interactions initiated by the child. The coding definitions used in the present study are provided in Table 2.

Table 2
Parent-Child Interactive Behavioral Definitions

	Behaviors
Parent's positive physical responses	Modeling, imitating and using gestures, pointing, showing, leaning toward child, moving closer to child, using affectionate touch (e.g. hug, pat), preventing actions (e.g. from falling), etc.
Parent's positive verbal responses	Asking questions, making comments, giving praise and approval, laughing, giving cheers, acknowledgements, expressions of affection, etc.
Child's positive physical initiations	Pointing, showing, requesting, turning head toward parent, etc.
Child's positive verbal initiations	Cooing, mumbling, giggling, imitating, requesting, completing an incomplete word, laughing, etc.

Parent-child interactions during the free play assessment were determined and coded by two independent raters utilizing a computer-assisted program, SCRIBE (Simple Computer

Recording Interface for Behavioral Observation) 4.2 (Duke & Stammen, 2012). The two raters analyzed 52 videotaped sessions; one rater observed child-participants while the other viewed parent-participants. An interval recording method was used to analyze each assessment. For each 10-minute play assessment, the raters observed for 15-second intervals for a total of 40 observation intervals per session, resulting in a total of 2080 observation intervals. The order of the videos was randomized so that observers were naive as to which assessments were pre- or post-intervention. Raters were trained on the definitions and coding of the behaviors. Once the raters achieved 85% reliability with the investigator for coding child and parent participant behaviors, they independently viewed and coded the videotaped free play assessments. The investigator served as a reliability observer and viewed 25% of the videotapes. The mean interrater reliabilities, calculated according to joint probability of agreement, were 86% for parents' physical responses, 88% for parents' verbal responses, 91% for children's physical initiations, and 89% for children's verbal initiations. Reliability percentages ranged from 81% to 93%.

Parent-child synchrony. The coding definitions applied to parent-child synchrony were referenced from the literature on mutuality in parent-child play and parent-child dyadic synchrony (Lindsey, Colwell, Frabutt, Campbell, & MacKinnon-Lewis, 2008; Linesey, Mize, & Pettit, 1997; Mize & Pettit, 1997). Parent-child synchronous behaviors were defined as the extent to which parent and child shared the same focus of attention, exhibited matched affect, and engaged in reciprocal and responsive exchanges. Parent-child free play behaviors were coded at 30-second intervals using a 5-point Likert type scale, with a higher score reflecting greater synchrony. Each play assessment received a synchrony score based on the average of ratings assigned across intervals. A total of 52 video clips were analyzed and randomly assigned to observers. Two experts in the field of early intervention served as the observers. Each of the two experts observed 26 randomly selected video clips of the participants during play assessments for a total of 52 video clips. For each 10-minute play assessment, the experts observed for 30-second intervals for a total of 20 observation intervals per session, resulting in a total of 1040 observation intervals. The investigator and two experts created the operational coding definitions used in the present study (see Table 3). Once the raters achieved 85% agreement with the investigator for coding behaviors of parent-child dyads, they independently viewed and coded the videotaped free play assessments. The investigator served as a reliability observer and

viewed 25% of the videotapes. The mean interrater reliability, calculated according to joint probability of agreement, was 87% for the total of twenty-six parent-child dyads. Reliability percentages ranged from 83% to 93%.

Table 3
Parent-Child Synchrony Rating Scale: Operational Definitions

Behaviors	
Scale = 1	Parent and child do not share same focus of attention; parent overly directs the interaction; child rarely engages parent in play; child does not respond to parent with verbalizations/vocalizations or physical acts; no or limited verbal or physical mutual exchanges between parent and child are observed.
Scale = 2	Parent and child share same focus of attention occasionally; parent directs the interaction; parent responds to child's acts occasionally; child engages parent in play occasionally; child responds to parent with verbalizations/vocalizations or physical acts occasionally; verbal or physical mutual exchanges between parent and child are observed occasionally.
Scale = 3	Parent and child share same focus of attention sometimes; parent sometimes directs the interaction and sometimes follows the child's lead; parent verbally or physically responds to child's acts frequently; child engages parent in play sometimes; child responds to parent with verbalizations/vocalizations or physical acts sometimes; verbal or physical mutual exchanges between parent and child are observed sometimes.
Scale = 4	Parent and child share same focus of attention frequently; parent directs the interaction occasionally; parent follows the child's lead and responds promptly and frequently; child engages parent in play frequently; child responds to parent with verbalizations/vocalizations or physical acts often; verbal or physical mutual exchanges between parent and child are observed often; positive emotional attunement is observed between parent and child.
Scale = 5	Parent and child share same focus of attention most of the time; parent directs the interaction occasionally; parent follows the child's lead and responds promptly most of the time; child engages parent in play most of the time; child responds to parent with verbalizations/vocalizations or physical acts frequently; verbal or physical mutual exchanges between parent and child are observed frequently; positive emotional attunement is observed between parent and child.

Post-intervention follow-up survey. Three months after completion of the education program, an early interventionist in the interdisciplinary team called the parent-participants to inquire whether they were still using the education materials or activities. The parents were informed that their responses would be anonymous to the investigator.

Data Analyses

Data were gathered from four sources: behavioral observations, questionnaires, activity logs, and feedback forms. The analyses used for each type of data were: (1) behavioral observations of parent-child interactive behaviors were treated as ratio data and were analyzed using a matched-pairs *t*-test for pre- and post-intervention comparisons; (2) behavioral observations of parent-child synchrony were treated as ordinal data and were analyzed using a Wilcoxon Matched-Pairs test for pre- and post-intervention comparisons; (3) questionnaire data were treated as ordinal data and were analyzed using a Wilcoxon Matched-Pairs test for pre- and post-intervention comparisons; (4) the time spent in play reported by parents was treated as interval data and were analyzed using descriptive analyses for pre- and post-intervention comparisons; (5) formative measures (activity logs) were treated as nominal data and were analyzed using descriptive analyses; and (6) perceived benefits of the parent education program were summarized using content analyses and qualitative descriptions.

CHAPTER FOUR

RESULTS

In order to answer the research questions posed in this study and to assess the effectiveness of the parent education program, data were obtained from four types of measures: behavioral observations, the PUMP questionnaire, and parents' final reports and activity logs. This chapter includes analyses of video observations and questionnaires pre- and post-intervention, as well as parents' final reports regarding perceived benefits of program participation, and use of music activities with their children across the six-week intervention period. Results are presented in response to the 12 research questions.

Behavioral Observations

Data Analysis for Research Question One

What is the effect of program participation on parents' positive physical and verbal responses during parent-child interactions?

Data were obtained from pre- and post-intervention observations regarding parents' positive physical and verbal response rates. Percentages of targeted behaviors exhibited across a 10-minute observation period were recorded. To examine the effect of program participation on parents' positive physical initiations, a matched-pairs t -test was conducted to examine the difference between the percentages of parents' positive physical responses during the pre-intervention assessment ($M = 10.38$, $SD = 5.51$) and the post-intervention assessment ($M = 15.29$, $SD = 9.12$). Results indicated a significant difference between parents' positive physical responses pre- to post-intervention ($t(25) = -2.6$, $p < .05$, $d = .51$) with the higher mean score of parents' physical responses during the post-intervention assessment. A matched-pairs t -test was also conducted to examine the difference between the percentages of parents' positive verbal responses during the pre-intervention assessment ($M = 55.48$, $SD = 20.31$) and the post-intervention assessment ($M = 62.77$, $SD = 17.19$). Results indicated a significant difference between parents' positive verbal responses pre- to post-intervention ($t(25) = -2.97$, $p < .01$, $d = .58$) with the higher mean score of parents' positive verbal responses during the posttest.

Summary Response to Research Question #1

Analyses of participants' play behaviors indicated that parent-child dyads' participation in a music-based education program significantly increased the parents' positive physical and positive verbal responses. The reported effect sizes of the intervention on parents' verbal responses ($d = .58$) and parents' physical responses ($d = .51$) were both medium.

Data Analysis for Research Question Two

What is the effect of program participation on children's positive physical and verbal initiations during parent-child interactions?

Data were obtained from pre- and post-intervention observations regarding children's positive physical and verbal initiation rates. Percentages of targeted behaviors exhibited across a 10-minute observation period were recorded. To examine the effect of program participation on children's positive physical initiations, a matched-pairs t -test was conducted to examine the difference between the percentages of children's positive physical initiations during the pre-intervention assessment ($M = 16.44$, $SD = 11.38$) and the post-intervention assessment ($M = 19.04$, $SD = 10.98$). Results indicated no significant difference between children's positive physical initiations pre- to post-intervention ($t(25) = -1.63$, $p > .05$). A matched-pairs t -test was also conducted to examine the difference between the percentages of children's verbal initiations during the pre-intervention assessment ($M = 35.38$, $SD = 24.13$) and the post-intervention assessment ($M = 41.35$, $SD = 25.12$). Results indicated a significant difference between the children's positive verbal initiations pre- to post-intervention ($t(25) = -2.25$, $p < .05$, $d = .44$) with the higher mean score of children's positive verbal initiations during the post-intervention assessment.

Summary Statement to Research Question #2

Analyses of participants' play behaviors indicated that parent-child dyads' participation in a music-based education program did not affect children's positive physical initiations; however, program participation did significantly increase children's verbal initiations. The reported effect size of the intervention on children's verbal initiations was medium ($d = .44$).

Data Analysis for Research Question Three

What is the effect of program participation on parent-child synchrony during parent-child interactions?

Data were obtained from pre- and post-intervention assessments regarding parent-child synchrony. A five-point scale was employed to assess parent-child synchronous behaviors at 30-second intervals. A total of 20 intervals were coded for each 10-minute free play assessment. The higher score reflects greater synchrony in terms of parent-child shared focus of attention, mutual exchanges of physical acts and verbalizations (vocalizations), emotional attunement, and matched affect. To examine the effect of program participation on parent-child synchrony, a Wilcoxon Matched-Pairs Signed Ranks test was conducted to examine the difference between the mean ratings of parent-child synchrony during the pre-intervention assessment ($M = 3.73$, $SD = 0.78$) and during the post-intervention assessment ($M = 4.10$, $SD = 0.70$). Results indicated a significant difference between pre- and post-intervention mean ratings ($z(26) = -3.52$, $p < .05$) with the higher overall score during the post-intervention assessment. The means and standard deviations of parent-child synchrony scores across the 10-minute free play assessments during pre- and post-intervention assessments are displayed in Table 4 and Figure 1. Gain scores from pre- to post-intervention assessments ranged from -0.25 to 1.40.

Table 4
Means, Standard Deviations, and Gain Scores for Parent-Child Synchrony

Dyad	Pretest <i>M (SD)</i>	Posttest <i>M (SD)</i>	Gains	Dyad	Pretest <i>M (SD)</i>	Posttest <i>M (SD)</i>	Gains
1	3.35 (0.93)	3.60 (0.88)	0.25	14	4.20 (0.52)	4.30 (0.66)	0.10
2	3.70 (0.92)	4.50 (0.61)	0.80	15	4.85 (0.37)	4.95 (0.22)	0.10
3	2.85 (1.14)	2.90 (0.85)	0.05	16	3.70 (0.66)	4.60 (0.60)	0.90
4	3.05 (0.94)	4.35 (0.93)	1.30	17	2.85 (0.67)	2.95 (0.83)	0.10
5	3.15 (0.81)	2.90 (1.02)	-0.25	18	4.60 (0.60)	4.65 (0.59)	0.05
6	4.65 (0.49)	4.75 (0.44)	0.10	19	3.90 (1.07)	4.65 (0.59)	0.75
7	3.95 (1.32)	4.55 (0.69)	0.60	20	3.50 (0.89)	3.45 (1.10)	-0.05
8	3.90 (0.91)	4.35 (0.67)	0.45	21	3.10 (1.02)	3.05 (1.05)	-0.05
9	4.85 (0.37)	4.65 (0.59)	-0.20	22	4.05 (0.69)	4.55 (0.51)	0.50
10	2.60 (0.88)	4.00 (0.79)	1.40	23	3.00 (0.73)	3.85 (0.59)	0.85
11	2.95 (0.76)	3.20 (0.70)	0.25	24	4.85 (0.37)	4.90 (0.31)	0.05
12	2.55 (0.89)	3.70 (1.26)	1.15	25	4.80 (0.41)	4.75 (0.55)	-0.05
13	3.20 (0.95)	3.50 (0.83)	0.30	26	4.85 (0.37)	4.95 (0.22)	0.10

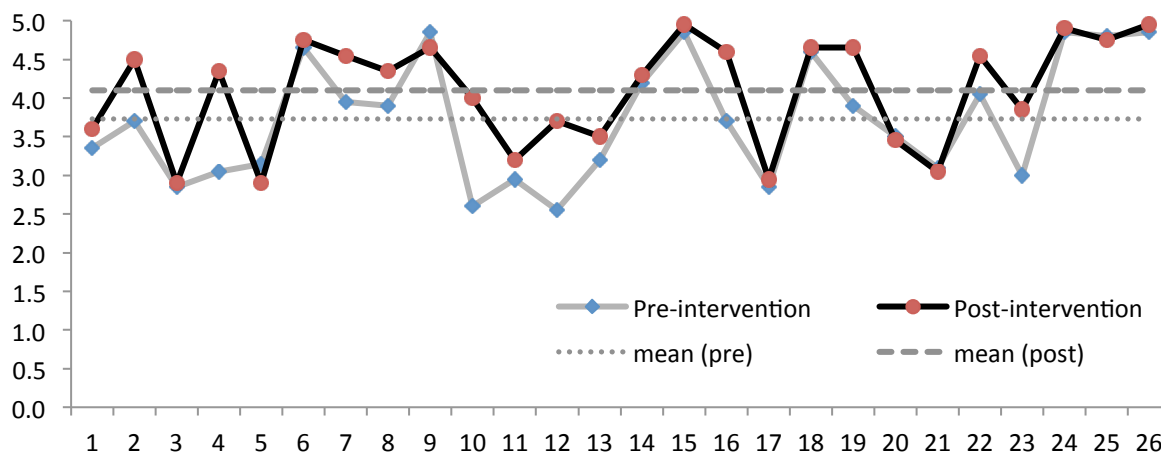


Figure 1. Pre- and post-intervention means of parent-child synchrony ($N = 26$).

Summary Statement to Research Question #3

Based on overall mean ratings, parent-child synchrony improved significantly after intervention; however, the mean parent-child synchrony scores for nine dyads remained relatively low (lower than pre-intervention overall mean) and the mean parent-child synchrony scores for another eight dyads remained relatively high (higher than post-intervention overall mean) during both the pre- and post-intervention assessments. The mean parent-child synchrony scores for the remaining nine dyads revealed greater gains (> 0.5) pre- to post-intervention.

Parental Use of Music and Play Questionnaire (PUMP)

Data Analysis for Research Question Four

What is the effect of program participation on parents' perceived musical abilities and degree of comfort using music to interact with their children?

Parent-participants' perceptions were measured using the PUMP questionnaire prior to and following the six-week parent education program. Questionnaire items #1 through #11 were used to address research question four. A five-point Likert type scale (1 = *strongly disagree* and 5 = *strongly agree*) was employed to measure parents' perceptions. The means, standard deviations, and mean differences for each questionnaire item pre- and post-intervention are provided in Table 5. Comparisons of the pre- and post-intervention mean scores for all items ($N = 11$) were made using the Wilcoxon Matched-Pairs Signed Ranks test.

Results indicated a significant difference between pre- and post-intervention mean scores ($T(11) = 1, p < .01, r = .61$) with post-intervention mean scores notably higher than pre-intervention mean scores. Based on mean gain scores, parents' perceived their musical abilities were affected by the intervention in several ways. They were better able to: provide musical variety, incorporate props into musical play, substitute lyrics, add motions to a song, and clap different rhythms. Because parents rated their ability to move to music high during pre-intervention assessment, there was little room for growth; therefore, they did not perceive any improvement in this musical skill.

Among the three types of music activities assessed (singing, playing instruments, moving), parents' comfort rating for 'moving to music' was highest in both the pre- and post-intervention assessments. Parents' comfort rating for 'playing instruments' was slightly lower than 'moving to music' both prior to and following the education program. In addition, parents' comfort rating for 'singing with their children' was lowest in both the pre- and post-intervention assessments.

Parents also perceived their abilities to use music to enhance their children's communication skills and to facilitate interactions with their children were also improved due to their participation in the education program.

Table 5
Parents' Perceived Abilities Regarding the Use of Music

Item	Music Abilities and Comfort Levels	Pretest		Posttest		Diff.
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
#1	I can clap different rhythms	4.50	0.65	4.81	0.83	+0.31
#2	I move freely with music	4.54	0.71	4.50	0.80	-0.04
#3	I can replace the original lyrics with new ones.	3.65	0.89	4.12	0.78	+0.46
#4	I can modify music and provide variety within musical elements by changing tempo, dynamics.	3.23	1.14	4.00	0.83	+0.77
#5	I can add some motions to a song.	4.27	0.67	4.69	0.54	+0.42
#6	I know how to use props (scarf, puppet, picture cards, etc.) with music.	4.00	0.85	4.65	0.67	+0.65
#7	I am comfortable singing to my child.	4.35	0.94	4.62	0.99	+0.27
#8	I am comfortable playing simple percussion instruments (shakers, tambourines, drums, etc.) with my child.	4.38	0.90	4.81	0.73	+0.42
#9	I am comfortable moving and dancing with my child.	4.58	0.64	4.88	0.85	+0.31
#10	I know how to use music to facilitate interactions between my child and me.	3.58	1.06	4.58	1.15	+1.00
#11	I know how to use music to enhance my child's communication skills.	3.15	1.01	4.58	1.36	+1.42

Summary Statement to Research Question #4

Among the six musical skills, results indicated parents' greatest gains were made in 'learning how to vary music activities within musical elements (e.g. tempo, dynamics)' and 'how to incorporate props (e.g. scarf, puppet, picture cards) into musical play.' Among the three types of musical activities (singing, playing instruments, moving), parent-participants reported that they felt most comfortable 'moving freely with their children' and least comfortable 'singing with their children' both pre- and post-intervention. Parents' greatest gain pre- to post-intervention was their comfort with 'playing instruments.' Pre- and post-intervention rank orders remained the same for parents' perceived comfort with the three musical behaviors: 1-moving, 2-playing, 3-singing. Finally, parents' perceived their ability to enhance their children's communication skills using music was most affected by the education.

Data Analysis for Research Question Five

What is the effect of program participation on parents' perceptions of their parent-child interaction characteristics during play?

Prior to and following the six-week parent education program, parent-participants' perceptions regarding their parent-child interaction characteristics during play were measured using the PUMP questionnaire. Questionnaire items #12 through #20 were used to address research question five. A five-point Likert type scale (1 = *strongly disagree* and 5 = *strongly agree*) was employed to measure parents' perceptions. The means and standard deviations for these questionnaire items, as well as the mean score differences pre- to post-intervention are provided in Table 6. Comparisons of pre- and post-intervention mean scores for all items ($N = 9$) were made using the Wilcoxon Matched-Pairs Signed Ranks test. Results indicated that there was a significant difference between the pre- and post-intervention mean scores ($T(9) = 0, p < .01, r = .63$) with the higher overall mean scores during the post-intervention assessment. Gain scores ranged from .23 to .77.

Table 6

Parents' Perceived Characteristics of Parent-Child Play Interactions

Item	Characteristics of Parent-Child Interactions	Pretest		Posttest		Diff.
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
#12	When playing with my child, I successfully help him/her to be productive in engagement with objects and/or others.	4.08	0.89	4.46	1.61	+0.38
#13	When playing with my child, I respond consistently and positively to his/her initiations, behaviors, or requests.	4.42	0.50	4.69	1.66	+0.27
#14	When playing with my child, I respond to him/her with animated facial expressions.	4.19	0.63	4.62	1.91	+0.42
#15	When playing with my child, I change my tone of voice dynamically.	4.08	0.69	4.31	2.18	+0.23
#16	When playing with my child, I wait for my child to initiate an act.	3.31	0.88	4.08	2.41	+0.77
#17	When playing with my child, I match my child's developmental, emotional, and behavioral levels.	3.65	0.94	4.35	2.51	+0.69
#18	When playing with my child, I match my child's interests.	4.15	0.78	4.58	2.64	+0.42
#19	When my child shows distress during playing, I know how to respond properly to him/her.	3.65	1.16	4.35	2.95	+0.69
#20	When playing with my child, my child follows my directions.	3.08	0.84	3.50	3.25	+0.42

Summary Statement to Research Question #5

According to pre- and post-intervention data, program participation positively affected parents' perceptions of these parent-child interaction characteristics: (1) waited for the child to initiate an act, (2) matched child's developmental, emotional, and behavioral levels, and (3) responded to the child properly when he/she showed signs of distress. Gain scores for the statement "waited for the child to initiate an act" implied that those parent-participants were less directive during post-intervention assessments than during pre-intervention assessments. Self-rating scores for the statement "consistent and positive parental responses to child's initiations, behaviors or requests" were highest for both the pre- and post-intervention assessments. These scores implied that parent-participants already considered themselves responsive during parent-child interactions.

Data Analysis for Research Question Six

What is the effect of program participation on parents' time spent in musical and non-musical play with their children?

Before and after the six-week parent education program, parent-participants reported how much time (in minutes) they spent per day in musical and non-musical play with their children. Descriptive analysis was conducted to answer this research question. The means and standard deviations for musical and non-musical playtime pre- and post-intervention are provided in Table

7. Comparisons of musical and non-musical playtime prior to and following the six-week parent education program are displayed in Figure 2 and 3.

Results indicated the overall reported mean time spent in musical play increased after program participation; whereas, the reported mean time spent in non-musical decreased after program participation. Five parent-participants reported that they never engaged in musical play with their children prior to their program participation. At the conclusion of the education program, they reported spending an average of 10 to 30 minutes per day engaged in musical play with their children. Seven parent-child dyads doubled their reported musical playtime pre- to post-intervention.

Table 7
Means and Standard Deviations for Musical Playtime and Non-Musical Playtime

Condition	Musical Playtime		Non-Musical Playtime		Total Playtime	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Pretest	24.42	24.09	141.54	92.89	155.58	103.29
Posttest	40.00	25.06	129.81	93.66	169.81	105.34

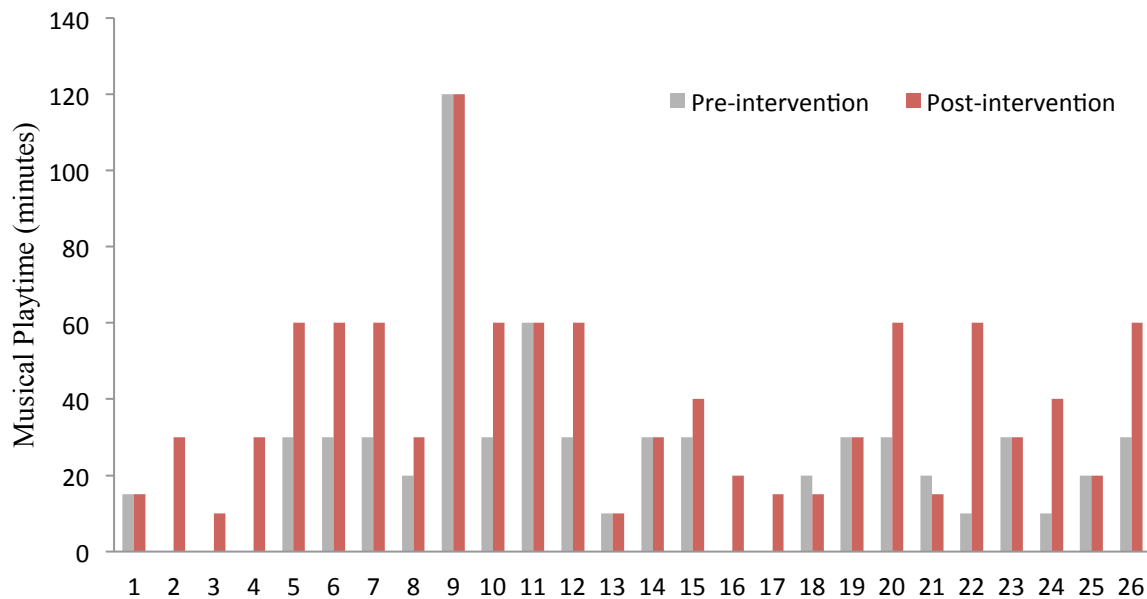


Figure 2. Pre- and post-intervention comparisons of parent-child musical playtime ($N = 26$).

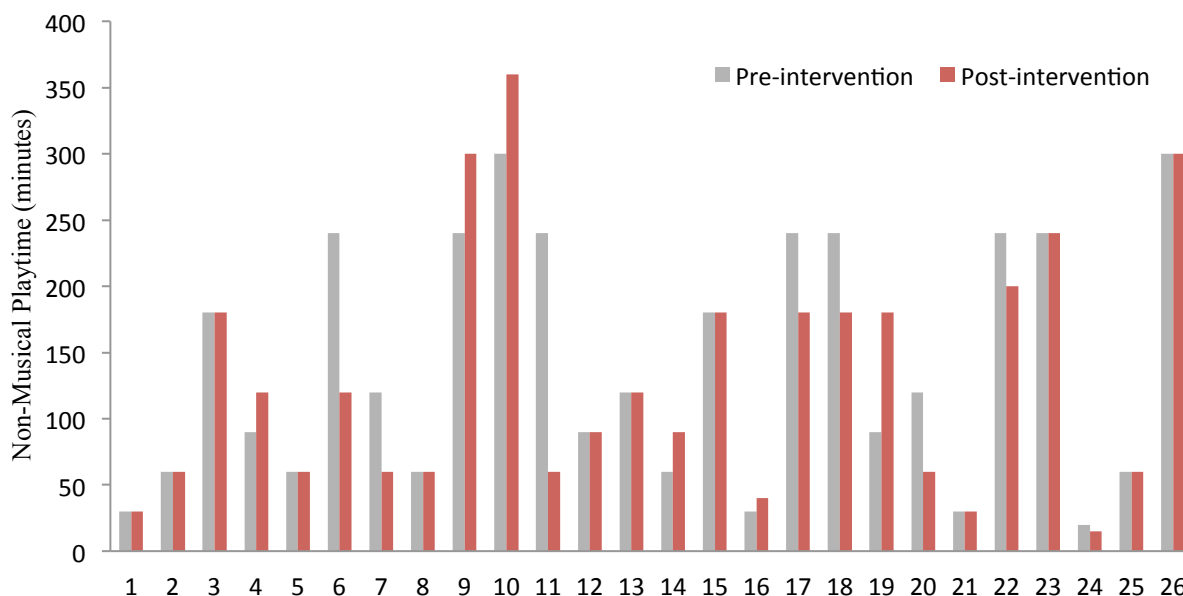


Figure 3. Pre- and post-intervention comparisons of parent-child non-musical playtime ($N = 26$).

Summary Statement to Research Question #6

Parents' reports indicated that average daily parent-child musical playtime increased, whereas parent-child non-musical playtime decreased slightly after program participation. The overall reported daily playtime (musical and nonmusical) increased slightly from pre- to post-intervention.

Data Analysis for Research Question Seven

What is the effect of program participation on parents' uses of musical activities (singing, playing instruments, moving to music, and listening to music) with their children?

Parent-participants ranked their use of musical activities at home (1 = *played most frequently* to 4 = *played least frequently*) based on their and their children's preferences. Descriptive analysis was used to answer this research question. Means and standard deviations of the ranks pre- and post-intervention are provided in Table 8. Group means of the overall ranks indicated that parents most often engaged in singing activities with their children prior to program participation, followed by listening to music, moving to music, and playing instruments. After the program, parent-participants reported that they most often engaged in playing instruments with their children, followed by listening to music, moving to music, and singing. Standard deviations for instrument playing activities decreased from 2.65 pre-intervention to

1.07 post-intervention, indicating that parents' use of instrumental playing activities were more diverse prior to program participation. Results indicated parents' use of the four music activities with their children was more similar after program participation (see Figure 4).

Table 8
Rank Means of Parents' Use of Musical Activities with Their Children

Activities	Pre-intervention			Post-intervention	
	<i>M</i>	<i>SD</i>		<i>M</i>	<i>SD</i>
Singing	1.65	0.85	Playing instruments	2.31	1.07
Listening	1.92	0.98	Listening	2.50	1.21
Moving to music	2.65	0.69	Moving to music	2.54	0.97
Playing instruments	3.65	2.65	Singing	2.65	1.26

Note. 1 = played most frequently and 4 = played least frequently.

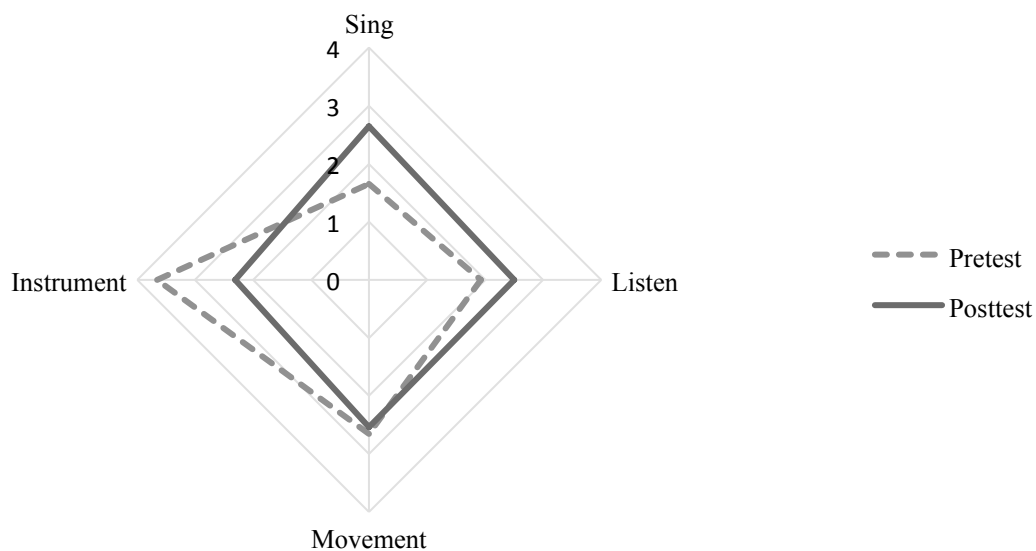


Figure 4. Pre- and post-intervention comparisons of rank means of parents' use of musical activities with their children

Summary Statement to Research Question #7

Parents' reports indicated that participation in the education program affected how frequently they used the four musical activities with their children. Prior to the education program, the parent-child dyads engaged in singing activities most frequently and in instrumental playing activities least frequently. Conversely, after program participation, parent-participants ranked playing instruments as their most frequent musical activity, and ranked singing as their

least frequent musical activity. Before the education program, parents and their children engaged in singing and listening activities more frequently than in moving and playing activities. However, after the education program, parents' uses of the musical activities (singing songs, listening to music, moving to music, playing instruments) were distributed more equally.

Parents' Reports and Activity Logs

Data Analysis for Research Question Eight

What do parents perceive to be the benefits of program participation?

Parent-participants' perceptions regarding the benefits of program participation were gathered through a feedback sheet completed at the conclusion of the education program. Frequency counts for each emergent theme and the rank order of emergent themes are provided in Table 9.

Table 9

Parents' Perceptions Regarding the Benefits of Program Participation

Rank	Emergent Theme	Frequency Counts
Benefits for Children		
1	Improved social skills	10
2	Improved language and expressive communication skills	8
2	Promoted enjoyment of musical play	8
4	Improved listening skills	6
5	Promoted new learning experiences	5
6	Increased focus of attention	1
6	Increased willingness to imitate	1
6	Increased self-confidence	1
6	Improved mood	1
Benefits for Parents		
1	Improved parenting skills	12
Benefits for Parent-Child Dyads		
1	Improved parent-child interactions	13
2	Increased parent-child and family bonding	12
3	Established new daily routines	4

Each parent participant listed three outcomes that were beneficial to his or her child or family. Content analysis was conducted on parents' statements. Each statement was categorized into one of the following domains: benefits for children, benefits for parents, or benefits for parent-child dyads. Further analysis was conducted for emergent themes. A total of 81 statements yielded nine themes related to benefits for children, one theme related to benefits for parents, and three themes related to benefits for parent-child dyads.

Summary Statement to Research Question #8

The benefits of program participation as perceived by parent-participants covered a variety of child developmental skills, parenting skills, parent-child interactions, as well as the well-being of the family. Overall, parents' reports yielded 13 emergent themes related to the benefits of program participation. The top benefit for children was improved social skills. The top benefit for parents was improved parenting skills. The top benefit for parent-child dyads was improved parent-child interactions.

Data Analysis for Research Question Nine

What do parents perceive to be the most beneficial responsive teaching strategy learned during the parent education program?

Parent-participants' perceptions were gathered through a feedback sheet completed at the conclusion of the education program. Each parent participant listed the responsive teaching strategy that was most beneficial to his or her child or family. Content analysis was conducted on parents' statements. Each statement was categorized into one of the following five dimensions as developed by Mahoney and McDonald (2007): affect (e.g. using animated expressions), match (e.g. adjusting responses according to children's developmental levels, interests and behavior styles), reciprocity (e.g. engaging in frequent physical or verbal exchanges), shared control (e.g. facilitating children's lead in play), and contingency (e.g. responding immediately to children's behaviors).

Frequency counts for each responsive teaching strategy and the rank order of responsive teaching strategies perceived to be beneficial are provided in Table 10. Results revealed that, based on parents' perceptions, the rank order of responsive teaching strategies perceived to be beneficial was: match, reciprocity, shared control, affect, and contingency.

Table 10

Parents' Perceptions Regarding the Most Beneficial Responsive Teaching Strategy

Rank	Dimension	Frequency Counts
1	Match	7
2	Reciprocity	6
3	Shared control	5
3	Affect	5
5	Contingency	3

Summary Statement to Research Question #9

According to the parents' reports, the statements were categorized into the following five dimensions: match, reciprocity, shared control, affect, and contingency. Parents perceived 'matching their children's developmental levels, interests, and behavioral styles' as the most beneficial responsive teaching strategy, followed by 'interacting with reciprocal and mutual exchanges between parents and children,' 'interacting with balanced and shared leading roles,' 'expressing with animated affect,' and 'responding contingently and accordingly to their children's behaviors.' Parents listed positive outcomes of their program participation as: increased shared focus of attention, prolonged child engagement with parent, improved interaction quality, increased mutual exchanges between parents and children, and alternated leads during play.

Data Analysis for Research Question Ten

What do parents perceive to be the most beneficial musical activity learned during the parent education program?

Parent-participants' perceptions were gathered through a feedback sheet completed at the conclusion of the education program. Each parent participant listed one musical activity that was most beneficial to his or her child or family. Content analysis was conducted on parents' statements. Each statement was categorized into one of the following types of musical activities: singing songs, playing instruments, playing musical games, moving to music, and relaxing to music. Frequency counts for each musical activity and the rank orders of musical activities perceived to be beneficial are provided in Table 11. Parent-participants identified musical games as the most beneficial music activity for their children or family. Ten parents' statements indicated that the "Stop-and-Go Game" taught their children how to listen attentively to music,

how to follow directions, how to create new rules for the game, and how to cooperate with their parents or siblings. ‘Moving to music’ and ‘playing instruments’ were ranked second, follow by ‘singing songs’ and ‘listening to music.’ Parents reported that children enjoyed moving-to-music activities because they could march or dance around in the house. Parents also reported that during the movement activities, they were able to easily mirror their children’s movements. Some parents reported the benefits of singing on children’s vocal production and the benefits of music-listening activities on parent-child relaxation.

Table 11
Parents’ Perceptions Regarding the Most Beneficial Music Activity

Rank	Type	Frequency Counts
1	Playing musical games	11
2	Playing instruments	6
2	Moving to music	6
4	Singing songs	2
5	Listening to music	1

Summary Statement to Research Question #10

Parent-participants perceived playing musical games with their children as the most beneficial musical activity, followed by playing instruments, moving to music, singing songs, and listening to music. The majority of parents considered the “Stop-and-Go Game” as an effective activity to: engage their children, train children’s listening skills, improve children’s communication skills, and elicit responses from their children. Parents reported that they and their children enjoyed exploring the variety of instruments. Parents also reported that moving to music was an easy and playful way to interact with their children.

Data Analysis for Research Question Eleven

What generalizations are parents able to make from the parent education program to their children’s daily routines?

Parents were encouraged to conduct a minimum of three music activities with their children per week over the six-week intervention period. Parents documented their progress in weekly activity logs and recorded the dates, settings, and durations of each musical episode. Descriptive analysis was conducted on parents’ reports in order to answer research question 11.

Frequency counts, mean durations, and standard deviations for musical episodes are provided in Table 12. Frequency counts of parent-child musical play ranged from 14 times to 39 times per dyad across the six-week intervention period (see Table 12). The mean durations of musical episodes per dyad ranged from seven to 30 minutes.

Table 12
Frequency Counts, Mean Durations, and Standard Deviations of Musical Episodes

Dyad	Frequencies	<i>M</i> (minutes)	<i>SD</i> (minutes)	Dyad	Frequencies	<i>M</i> (minutes)	<i>SD</i> (minutes)
1	39	14.87	6.54	14	18	12.69	2.59
2	30	18.57	7.19	15	18	10.37	5.34
3	28	12.04	6.24	16	17	28.24	7.28
4	26	9.46	7.50	17	17	9.71	4.50
5	23	20.87	9.72	18	17	7.47	2.81
6	23	14.89	3.84	19	16	30.44	16.20
7	23	12.35	7.26	20	16	15.54	8.64
8	22	30.91	9.08	21	16	12.00	7.89
9	21	14.19	5.64	22	16	11.25	5.63
10	21	12.62	7.18	23	15	21.33	9.15
11	19	8.32	3.73	24	15	11.69	3.81
12	19	6.57	3.80	25	15	10.00	4.77
13	18	20.00	9.07	26	14	11.00	5.48

Parent-participants reported they used music during playtime, during meals, during caregiving (e.g. bath time, diaper changing), in the car, before bed time, and on the playground; therefore, music activities were successfully generalized to other family routines. The investigator provided CDs of the songs learned during the education sessions to the parents; as a result, more than three-fourth of the families listened to the songs during transportation time. More than half of the parents used the songs before bed time. About half of the parents also embedded music into the children's meal time and caregiving time. In addition, parents also reported that they sang with their children at the playground. Several parents noted the education materials were used by therapists in other therapeutic settings.

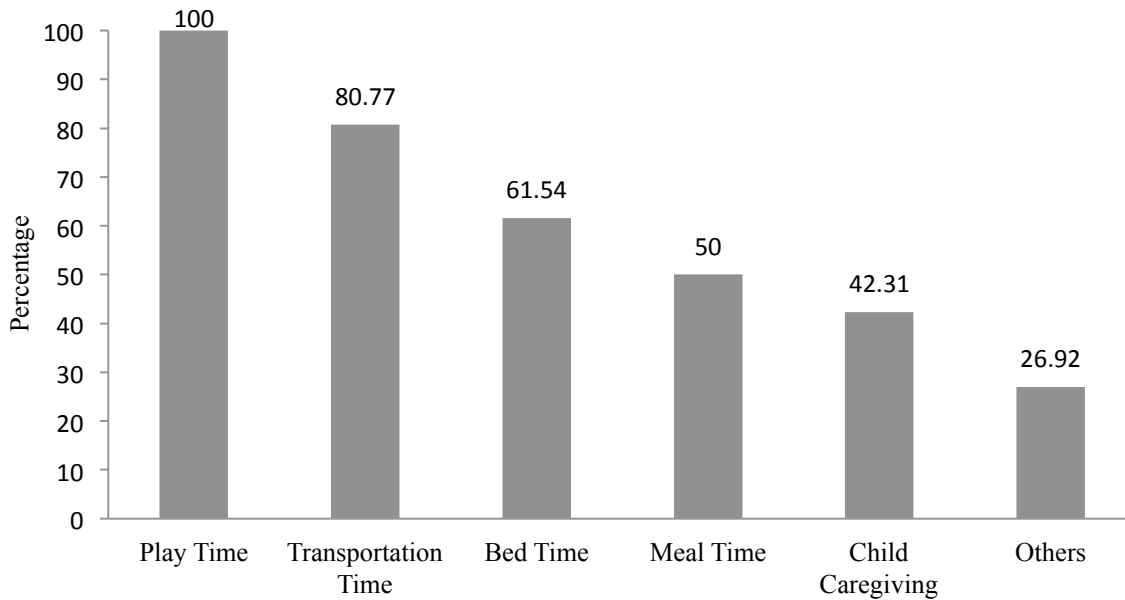


Figure 5. Parents' use of music within children's daily routines

Summary Statement to Research Question #11

Parent-participants reported that they conducted music activities with their children an average of two to six times per week during the intervention period. The mean durations of musical episodes ranged from seven to 30 minutes. Education materials were applied to a wide range of children's routines such as playtime, transportation time, bed time, meal time, caregiving time, and outdoor playtime.

Data Analysis for Research Question Twelve

Do parents continue to use the musical activates and program materials after completion of the study?

Descriptive data gathered from telephone interviews with parents were used to answer research question twelve. Twenty-five out of 26 families completed the follow-up telephone interview. Among these 25 families, 23 parents (92%) reported that they still used the education materials and activities in their homes three months after completion of the education program. Results indicated that five parents conducted music activities with their children every day, seven parents conducted music activities with their children three to five times a week, and 11 parents conducted music activities with their children once or twice a week (see Figure 6).

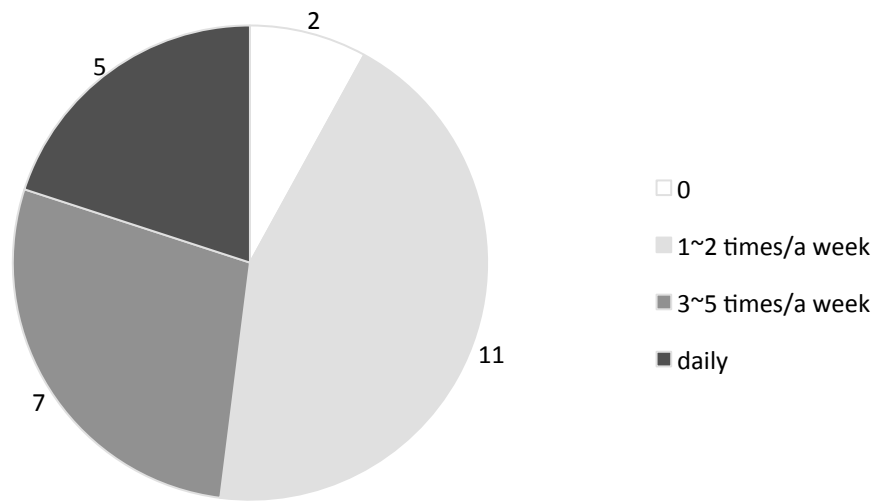


Figure 6. Parents' use of musical activities (post-intervention)

Summary Statement to Research Question #12

Data from follow-up telephone interviews indicated that 92% of the parent-child dyads still used the education materials and musical activities three months after the education program ended.

CHAPTER FIVE

DISCUSSION

The purpose of this study was to investigate the effect of parent-child dyads' participation in a home-based parent-education program in music on parent-child interactions. All participating dyads included children with disabilities or developmental delays between one and three years of age. Secondary purposes of the study were to examine parents' use of education materials within daily routines and parents' perceptions regarding the benefits of program participation. This chapter includes discussion of the findings, relevance of the findings to extant literature, limitations of the current study, suggestions for future research, implications of the findings for early intervention music therapy practice, and conclusions of the study.

Parent-Child Interactions

Parent-participants. Overall, participation in the education program, *Musical Bonds*, facilitated parent-child interactions, particularly parents' physical and verbal responses. This education program was designed to enhance parent-participants' parenting skills; and thus, alter their children's behaviors. Parents' physical and verbal responses increased significantly during parent-child free play pre- to post-intervention. Positive outcomes of the education were identified through behavioral observations and parents' self-reports. Parents reported that they waited longer for their children to initiate acts, and they also allowed their children to take more leads during play, both of which have shown to be beneficial to a child's development (Kaiser, Hemmeter, Ostrosky, Fischer, Yoder, & Keefer, 1996; Kaiser & Hester, 1997; Stephenson, Martin, & Linfoot, 2005). Some researchers have found that mothers of children with developmental delays are typically more directive and less responsive than mothers of children without disabilities (Schneider & Gearhart, 1988; Marfo, 1990; Pennington & McConachie, 2001); however, some parent-participants were able to interact responsively with their children even before their participation in the education program, and most were able to do so post-intervention.

Data indicated that 19 parent-participants exhibited increased physical responses, and 18 parent-participants exhibited increased verbal responses during the post-intervention assessment.

In addition, half of the parent-participants exhibited gains both in physical and verbal responses during the post-intervention assessment. These data support the findings of Kong and Carta (2011) who also found that parents were capable of positive changes in their responsive behaviors after education.

Depending on interaction contexts and children's behavioral styles, parents play different roles during parent-child interactions, such as facilitators, teachers, caregivers, or playmates (Renninger & Sigel, 2006; Santos & McCollum, 2007). In the present study, several parents demonstrated teaching behaviors during play interactions. Parents commonly named objects or the colors of objects for their children and asked their children to repeat what they had said. Parents took more leading roles when they acted as a teacher. Parents who acted as a playmate shared leading roles more than parents who acted as a teacher.

Child-participants. Data in the present study indicated that among the 26 child-participants, 17 children increased their verbal initiations pre- to post-intervention. Four children who exhibited relatively greater gains (over 20%) in verbal initiations had functional speech skills. In contrast, children without functional speech skills exhibited relatively small or no gains in verbal initiations during the post-intervention assessment. These findings imply the education program was perhaps more effective in increasing the verbal initiations of children who already used speech for communication purposes.

Participation in the education program did not have a significant effect on children's physical initiations. This finding may be due to the nature of the children's disabilities. Some child-participants had cerebral palsy or other physical disabilities. These disabilities may have limited the children's ability to engage in certain physical acts, such as picking up an instrument or object, pointing or using other gestures.

Parent-child dyads. The findings of this study support those of earlier studies that indicate music can facilitate parent-child interactions and enhance parent-child bonds (Cunningham, 2011; Drake, 2011; Harris, 2001; Mackenzie & Hamlett, 2005; Nicholson, Berthelsen, Abad, Williams, & Bradley, 2008; O'Callaghan & Jordan, 2011; Pasiali, 2010; Shoemark, 1996; Walworth, 2009; Wylie, 2004). The music-based teaching strategies encouraged parents to be more responsive and less directive during parent-child interactions; thus following the suggestions of early intervention professionals (Kaiser et al., 1996; Mahoney & Perales, 2003). Throughout the intervention, parent-participants learned to adjust and adapt

their interaction styles according to their children's behavioral characteristics and needs, while child-participants learned to engage and to share music activities with their parents.

Parent-Child Interactions by Children's Disability

This project recruited any family whose children qualified for Part C early intervention services. Children with a variety of developmental needs participated in this study. The findings of the study are discussed in relation to child-participants' disabilities or developmental concerns.

Children with autism. Parents of children with autism made positive comments on their children's increased responses to and willingness to imitate their acts or verbalizations. Several children with autism demonstrated improved imitation skills during the post-intervention assessments. One child named the colors of the stacking blocks after his mother, and another child asked his mother to blow bubbles for him. When children imitated their parents, parents considered these imitation acts to be indicators of compliance and responsiveness.

Although children were encouraged to take the lead during play interactions, it was sometimes necessary for parents to be directive or to take the lead with children who exhibited low initiation behaviors. For children who exhibited stereotypical behaviors (e.g. spinning wheels, lining up toys), it was necessary for parents to interrupt these behaviors by distracting the child with new activities or incorporating other materials into their play. If the children were not interested in the new object their parents introduced to them, parents learned to wait longer and to re-introduce the new object. Expanding children's play skills has been found to be effective in increasing children's engagement and mutual exchanges with their parents (Rocha, Schreibman, & Stahmer, 2007; Solomon, Necheles, Ferch, & Bruckan, 2007). Several mothers of children with autism commented that they had learned new ways to interact with their children and to discourage their children's stereotypical behaviors.

Children with intellectual disabilities or global developmental delays. Prior to their participation in the education program, some parents were unable to identify their children's play interests. One child communicated to his mother that he wanted to play with the instruments by pulling his mother's shirt and pointing to the instrument package on top of the shelf. When children communicate more clearly, it is easier for their parents to address their needs or to

accommodate their wishes. Another child danced around the house when her mother played the CD. Such overt acts make it possible for parents to understand their children's interests.

Two parent-child dyads, that both included children with Down syndrome, exhibited different interaction patterns. One parent was directive in that she determined all the activities for her child and always took the lead role during the pre-intervention assessment. The other parent followed the child's lead and let her child determine which activities they would engage in. During the post-intervention assessments, both parents engaged in more shared control, thus prolonging their children's engagement during play.

Children with language delays. For the parents of children with language delays, their purpose for participating in the education program was to learn new ways of improving their children's expressive communication skills. Singing activities require vocal production, and improvised singing allows for errorless sound-making (Koutsoupidou & Hargreaves, 2009). The investigator encouraged those parents to act as vocal models for their children. In addition, the musical play motivated these children to verbally express their preferences for selected activities. Prior to the education program, parents reported that their children became discouraged and stopped trying to say words when they could not understand them. Parents made positive comments that the repetition used in songs allowed their children to purposefully repeat words, to practice the vocabularies needed within musical play, and ultimately, to gain more confidence in verbally expressing themselves.

Children with hearing impairments. Two children with hearing losses participated in the study. One child with a mild hearing loss in one ear demonstrated fluent verbal skills, and another child with a cochlear implant in one ear mostly imitated her mother's words. Both children's cognitive abilities were intact; therefore, they played a dominant role in leading the musical activities, and the mothers followed their children's lead most of the time. One child's spontaneous verbalizations increased slightly when her mother waited longer for a verbal response. However, both mothers frequently corrected their children's mispronunciations and misuse of words. The structure of the education program required parents to verbally model for their children, thus allowing the young children with hearing losses to utilize and practice their verbal skills. This responsive style of teaching is essential to improving the expressive communication skills of children with hearing losses (Peck, 2000); however, over-correction can sometimes result in a child's reluctance to speak (Hart, 1980).

Children with motor disabilities. One child with cerebral palsy participated in the study. The parent frequently used physical responses to prevent the child from losing balance, especially when the child needed to move from one place to another. The child's hemiplegia also affected his left hand such that he refused to use this hand while manipulating the objects. During musical play, the therapist encouraged the child to use both hands alternately or simultaneously in order to promote his motor skills. During the pre-intervention assessment, the mother said "uh-oh" every time the child failed to hold or to assemble objects successfully. The child exhibited frustration and was unwilling to complete the task independently due to the mother's responses. When the mother allowed more time for the child to complete a task and ceased negative feedback, the child was more willing to use his left hand. Thus, the parent's positive feedback and delayed responses (allowed more time for the child to complete a physical task) were essential to increasing the child's self-confidence and willingness to perform manual tasks.

Parent-Child Synchrony

The results of this study support the findings of earlier studies' regarding the abilities of parent-child dyads to increase synchronous interactions (Aldred, Green, & Adams, 2004; Landa, Holman, O'Neill, & Stuart, 2011). Data on participants' increased parent-child synchronous interactions demonstrate that parents and their children are capable of learning to adapt to each other's play characteristics. Although results of the present study indicated that overall parent-child synchrony increased significantly, only nine out of 26 parent-child dyads exhibited noticeable improvement pre- to post-intervention. Eight parent-child dyads had pre- and post-intervention synchrony scores that were relatively high compared to the overall means. The potential for improvement in these cases was limited. Among these dyads, seven of the eight children were verbal and therefore, frequently initiated interactions during the pre-intervention assessments. Their parents responded to them appropriately, promptly and frequently. Even though the remaining one child was nonverbal, her mother, who was a kindergarten teacher, was sensitive and responsive to the child's vocal signals and gestures. This mother also frequently followed her child's lead.

The mean synchrony scores of the remaining nine parent-child dyads were relatively low (lower than the pre-intervention overall mean) pre- and post-intervention. Six of these nine

children were diagnosed with autism. A high level of parent-child synchrony requires mutual involvement and exchanges between parent and child, a behavioral characteristic that is considered atypical for children with autism. Although the parents initiated and responded frequently to their children, the lack of communicative acts and responses from the six children resulted in low rates of mutual engagement.

Limitations of the Present Study

This study was a pioneer investigation of a home-based music program for parents and young children with disabilities. Analyses of the data indicated factors that may have potentially influenced the effectiveness of the intervention, such as: characteristics of the parent-participants, severity of child-participants' disabilities, the influence of repeated measurements, parents' compliance with the treatment implementation, and intensity of the intervention.

Due to parent characteristics and the sample size in this study, findings need to be interpreted with caution and cannot be generalized to the whole population of families with young children who have disabilities or developmental delays. The parent-participants who volunteered for the education program were highly motivated to learn new ways of helping their children. There might be other parents who needed help but did not participate in this study because of their work schedules or because of their children's involvement in other therapeutic interventions, or because they knew they would be unable to implement the activities on a daily basis. The recruitment process was directed to families already involved with *Early Steps*. In the future, an optimistic goal may be to provide the education program to families that are not yet receiving services from any agency.

Child-participant characteristics may have also affected the results of the study. Since this was the first investigation of a home-based parent education program in promoting parent-child interactions in music, the investigator did not set any exclusion criteria based on child-participants' disabilities or examine the data based on child-participants' disabilities. The findings indicated the interactions of parent-child dyads that included children with speech skills were different from those interactions of parent-dyads that included children who were nonverbal. In addition, parent-child interactions in families with children who had autism were frequently different from families with children who had other disabilities. In the future,

researchers may wish to consider child-participants' speech or communication characteristics as an experimental factor in the design of the study.

Use of a pretest-posttest within-subject single group design in this study raised concerns due to the use of repeated measurements and the lack of a control group. External validity was jeopardized because there was no way of judging whether the pre-intervention assessment actually influenced participants' responses on the post-intervention assessment, and because there was no measurement against a parent-child group that did not receive intervention. Some safeguards were taken to minimize these threats to validity. Although the free play assessment was conducted prior to and following the education program, parent-participants were not told which specific behaviors the investigator was evaluating. In addition, the observers who evaluated the pre- and post-intervention videos were naive as to which videos were pre- or post-intervention.

Parents' compliance with the intervention tasks could be a confounding variable associated with the intervention effect found in the present study. Parents' compliance was documented from their activity logs. Parents were encouraged to conduct music activities with their children at least three times a week. Parent-participants recorded their weekly implementation of the interventions. They were requested to be truthful and told that no contingencies were set if they did not follow the intervention guidelines. There was no way of determining parents' truthfulness in reporting their use of the education materials and music activities at home.

Although the use of a six-week parent education program altered parents' responsive behaviors and is supported in the literature (Cummings, 2000), this short-term intervention had greater impact on the parents of children with higher functional skills (in terms of cognition and expressive communication skills) than children with lower functional skills. In order to more fully examine the impact of parent education in music on parent-child interactions, children with lower functional skills may need a longer intervention period.

Another possible limitation of the present study may have been the Pygmalion effect (Murphy, Campbell, & Garavan, 1999). Positive changes of parents' behaviors and perceptions post-intervention might be due to a self-filling prophecy. In this study, parents received education on parent-child interactions and interactive musical play. They were aware of the trainer's expectations for improvement over the intervention period; therefore, on the post-

intervention self-assessment, parents may have rated their abilities and skills higher. Nevertheless, awareness of session objectives may have also resulted in parents acting more responsively during the post-intervention assessment. Regardless of their motivation, once parents engage in responsive behaviors with their children and are made aware of the benefits of these behaviors, they are more likely to respond to their children in ways that result in positive interactions.

Implications of Findings to Early Intervention Music Therapy

Findings of the present study have various implications for music therapy practice.

Home-based interventions. Results of the study suggest that interventions for young children may be provided in the natural environment, and that interventions may be more effective when parents are involved and can reinforce treatment strategies on a daily basis. Most music therapy services are not, however, provided in the home, but in community group settings. While home-based interventions are beneficial, therapists who provide services in homes spend considerable time traveling from house to house, taking time that might be spent working with additional families or documenting their work. Music therapists who do home-based interventions serve fewer families compared to those who work in clinic-based settings or to those who conduct music therapy group sessions. Music therapists who wish to educate parents can consider providing short-term home-based music therapy intervention.

Generalization of learned skills is a key factor to intervention effectiveness. Home-based interventions make it easier for parents to generalize the learned skills. Parents are not always able to transfer learned skills from clinical settings to the home environment or from a musical context to other daily routines. When services are provided in the home, music therapists can coach parents on how to generalize learned skills. For example, to relate musical play experiences to toy play experiences (non-musical), music therapists can apply the interaction skills taught during the music therapy session to a toy play context at the end of a session, thus modeling how to generalize from one situational context to another.

In the present study, the home-based interventions were particularly convenient for the mothers who worked full-time. Because the sessions were provided in the late afternoon or early evening, they could participate in the program without taking time off from work. While convenient for mothers who work, home-based interventions are not as convenient for music

therapists who may not have flexible schedules that can accommodate only afternoon or evening sessions.

Parent-child interventions. Parent-child interventions have been commonly used in the early childhood field (Edelman, 2004; Gilkerson & Kopel, 2005; Heinicke, Fineman, Ruth, Recchia, Guthrie, & Rodning, 1999; Kelly, Zuckerman, & Rosenblatt, 2008; Mahoney & Perales, 2005). When working with parent-child dyads, music therapists can provide interventions for both parents and children. Parent-child interventions can be structured such that parents and children understand how their behaviors affect one another. Music therapists can resolve problems in parent-child interactions by addressing the causes and effects of dyadic behaviors. Results of the present study indicate that parent-child interventions are an effective way for music therapists to address problems in parent-child interactions.

Professional relationships. For music therapists who wish to work with young children and their families, it would be wise to establish a good working relationship with professionals who work in early interventions programs. Music therapy services are not routinely provided in early intervention programs. Most of the participants in the present study were referred to the researcher by their current early interventionists. It would have been difficult to identify and to recruit participants without their assistance. The low attrition rate (only one out of 27 families dropped out of the study) implied that the interventionists who referred families for participation in this project likely had good rapport with the parents. The quality of their relationship likely generalized to the investigator and made it easier to establish trust with the families and to complete the education program.

Some families shared the music education materials with their early interventionists, who then used the materials during their sessions with the families. Although the education materials were designed specifically for parents, the early interventionists were able to adapt the materials to the purposes of their therapy sessions. *Musical Bonds* not only expanded parents' activity repertoire, but also those of the interventionists. These anecdotal findings have important implications for music therapists' work with other professionals, and for establishing relationships with relevant agencies and other therapists.

Expanding families' musical experiences. Parents who participated in the present study were able to incorporate musical instruments into play with their children. Because of the nature of the study, it was important for parents to use the instruments when implementing the session

strategies during the week; thus, necessitating all families have instruments available. Most music therapists bring their own instruments when they provide therapy in the home, and take them when they leave. Providing instruments to families can be expensive, especially if the instruments are not cared for properly. Few music therapists could assume that kind of financial responsibility; therefore, it would be important for music therapists to seek outside funding in order to provide materials to families such as musical instruments or CDs. Because active music-making experiences are beneficial to young children (Fox, 2000), and to young children with disabilities or developmental delays (Allgood, 2005; Shoemark, 1996), time spent seeking funding may well be worth it to music therapists.

Suggestions for Future Research

In order to benefit more families by providing home-based parent education, the investigator recruited all families from Part C services without setting up exclusion criteria in terms of children's disabilities. Early interventionists referred many parents of children with autism to the researcher. In addition, parents of young children with other communication disorders have reported a need for music therapy (Yang, 2011). Parents of children with deficits in their social-communication development may see a greater need for interactive music therapy interventions than parents of children with other types of disabilities. Researchers may wish to further explore an interactive approach in music therapy with children who have autism or other communication needs. As a result, additional intervention strategies may be identified that will aid these children's communication and language skills and promote positive parent-child interactions.

In this study, parents reported the benefits of musical games and instrumental playing activities in connecting with and relating to their children with disabilities. Some parents found that playing instruments and musical games engaged their children more effectively than singing activities. The benefits of engaging children with disabilities in playing instruments or musical games appeared to be under reported in the review of literature. Future researchers should continue to examine the benefits of musical games and instrumental playing in promoting the communication skills and social development of young children.

Analysis of parents' home activity logs revealed a noticeable difference in the mean frequency and length of music episodes. According to parents' reports, music playtimes ranged

from an average of 10 to 120 minutes per day, and the total playtimes (including music and non-musical play) ranged from 45 to 420 minutes. When interpreting the raw data for each parent-child dyad, two factors are potentially associated with the frequency and length of musical playtimes: maternal employment and number of siblings in the family. Future researchers may wish to examine the relationship between these two factors and outcome measures, and between the intensity (frequency) of parents' intervention implementation and outcome measures.

The optimal goals of the parent education were to facilitate parent-child interactions, but also to promote the quality of life for families of children with disabilities or developmental delays, and to improve child-participants' development. Although the investigator did not specifically examine benefits of program participation on children's communication and language skills, potential benefits were identified through observations of their interactive behaviors and informal parent reports. In order to more fully determine effects of the education program on children's overall development, future investigators may wish to assess children's language, communication, and social skills through standardized assessments, and by conducting longitudinal investigations.

Conclusions

Young children's learning experiences stem from daily interactions with their parents. The findings of this study indicated that music can facilitate parent-child interactions in terms of parental responsiveness and child initiated communication, as well as promote parent-child synchrony and parenting skills. In addition, parents were able to incorporate responsive teaching strategies into musical contexts with their children. Parent-child dyads also expanded their repertoire of play activities.

Musical Bonds provided an evidence-based intervention to connect young children and their parents. Parents considered the parent education in music beneficial and learned how to incorporate interactive musical play with their children. The education program helped parents learn how to embed music activities into their children's daily routines, and how to use music for functional purposes. Results of this study also indicate that music activities can enrich the quality of parent-child play. Almost all parents continued to use the music activities and education materials in their homes after the conclusion of the education program. In addition, the early intervention professionals involved in this study perceived the *Musical Bonds* education program

as valuable. Finally, the *Musical Bonds* education program served as an additional intervention tool that early childhood specialists and parents of young children with disabilities or developmental delays can use in the home.

APPENDIX A

QUESTIONNAIRE: PARENTAL USE OF MUSIC AND PLAY

The Parental Use of Music and Play

Child's Date of Birth (mm/dd/yy): _____ Child's Gender: ☐Male ☐Female

Child's Race: ☐White ☐Black/African American ☐Hispanic ☐Other: _____

Mother's Age: _____

Is child's father currently employed? ☐Full-time ☐Part-time ☐No

Is child's mother currently employed? ☐Full-time ☐Part-time ☐No

Mother's highest level of education

☐Middle school ☐High school ☐Associate degree ☐Bachelor ☐Master ☐PhD/JD/MD

Father's highest level of education

☐Middle school ☐High school ☐Associate degree ☐Bachelor ☐Master ☐PhD/JD/MD

Please circle the amount that best describes your family's total annual income

☐\$0-\$20,000

☐\$20,001-\$40,000

☐\$40,001-\$60,000

☐\$60,001-\$80,000

☐\$80,001-\$100,000 or higher

Part I: Parents' perceived knowledge, perceived skills and comfort level with music

The following questions indicate your perceived knowledge and skills about the use of music and your comfort level with music. For each statement, please **circle one** answer that reflects your degree of agreement with the statement.

1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

1	I can clap different rhythms.	1 2 3 4 5
2	I move freely with music.	1 2 3 4 5
3	I can replace the original lyrics with new ones.	1 2 3 4 5
4	I can modify music and provide variety within musical elements by changing tempo, dynamics.	1 2 3 4 5
5	I can add some motions to a song.	1 2 3 4 5
6	I know how to use props (books, scarf, puppet, etc.) with music.	1 2 3 4 5
7	I am comfortable singing to my child.	1 2 3 4 5
8	I am comfortable playing simple percussion instruments (shakers, tambourines, drums, etc.) with my child.	1 2 3 4 5
9	I am comfortable moving and dancing with my child.	1 2 3 4 5
10	I know how to use music to facilitate interactions between my child and me.	1 2 3 4 5
11	I know how to use music to enhance my child's communication skills.	1 2 3 4 5

Part II: Parent-child interactions during play

The following questions indicate the ways you play with your child. For each statement, please **circle one** answer that reflects the interaction between you and your child.

1 = Never, 2 = Seldom, 3 = Sometimes, 4 = Frequently, 5 = Almost Always

12	When playing with my child, I successfully help him/her to be productive in engagement with objects and/or others.	1 2 3 4 5
13	When playing with my child, I respond consistently and positively to his/her initiations, behaviors, or requests.	1 2 3 4 5
14	When playing with my child, I respond to him/her with animated facial expressions.	1 2 3 4 5
15	When playing with my child, I change my tone of voice dynamically.	1 2 3 4 5
16	When playing with my child, I wait for my child to initiate an act.	1 2 3 4 5
17	When playing with my child, I match my child's developmental, emotional, and behavioral levels.	1 2 3 4 5
18	When playing with my child, I match my child's interests.	1 2 3 4 5
19	When my child shows distress during playing, I know how to respond properly to him/her.	1 2 3 4 5
20	When playing with my child, my child follows my directions.	1 2 3 4 5

The daily musical playtime with my child: _____ (minutes)

The daily non-musical playtime with my child: _____ (minutes)

Please rank the frequency of the musical play with your child.

1 = Most Frequently, 4 = Least Frequently

_____ Listening _____ Singing _____ Instruments Playing _____ Dance & Movement

APPENDIX B

THE MUSIC-BASED PARENT EDUCATION PROGRAM

Session 1

Objective: Parents will learn how to: (1) incorporate instrumental playing during musical play, (2) replace lyrics of a song, and (3) incorporate the use of props (such as scarf, puppet, etc.) in songs.

Music: (1) Singing: Music & Play (2) Singing: Animal Song (3) Singing: Clap your hands (4) Music game/Instrument playing: Stop and Go 1 & 2 (5) Listening/Instrument playing: Shaker Song (6) Movement: Dance 1 (7) Singing: Sweet Baby (8) Ending: Relaxation 1	Materials: Shakers Tambourine Lollipop drum Stuffed animals Scarf or soft fabric CD player
---	---

Preparations:

1. Put your CD 1 in the player.
2. Prepare some stuffed animals (such as cat, dog, etc.) and hide them in a place that your child won't be able to reach or see.
3. Get your instrument package ready.

Procedures:

1. [Music & Play]: Sing joyfully and move freely.
2. [Animal Song]: Hold the stuffed animal (dog) in your hand while singing. Hold a different stuffed animal (cat) for the next verse of the song. Pick other animals and incorporate them in the lyrics.
3. [Clap Your Hands]: Model the clapping for your child. Touch your child's hand and clap with him/her. Clap whatever rhythm you and your child like during the instrumental accompaniment.
4. [Stop and Go]: Pick an instrument for your child and yourself. You can also let your child pick. Play freely with the music. When the music stops, the instrumental playing stops.
5. [Shaker Song]: You and your child both play the shakers together or you can slightly touch your child's shaker to yours with the beat.
6. [Dance 1]: Hold a scarf or soft fabric and wave freely with the music.
7. [Sweet Baby]: This is a song for you to sing to your child. Look at his/her eyes and sing with smiles.
8. [Relaxation 1]: Tell your child that the music time is over. You can find a comfortable position for you and your child and listen to the music quietly.

How successful was I?

Did I feel comfortable playing instruments with my child?

Could I replace the lyrics of a song with new ones?

Could I incorporate props (such as scarf, puppet, etc.) with the songs?

Session 2

Objective: Parents will show positive facial expressions and change their tone of voice dynamically during play.

Music: (1) Singing: Music & Play (2) Listening: Rhythm 1 & 2(slow & fast) (3) Singing: Animal Song (4) Singing: Clap your hands (5) Music game/Instrument playing: Stop and Go 1 ~ 3 (6) Movement: Marching 1 (7) Relaxation 1 (8) Singing: Sweet Baby	Materials: Shakers Tambourine Hand drum Stuffed animals or animal cards CD player
---	---

Reminders to parents:

1. Your facial affect, tone of voice, and energy level during musical play set the tone and the atmosphere for a child.
2. Act as a playful partner during musical play.
3. During the musical play, you should be always physically available and act gently.

Preparations:

1. Put your CD 2 in the player.
2. Prepare some stuffed animals (such as cat, dog, etc.) and hide them in a place that your child won't be able to reach or see.
3. Get your instrument package ready.

Procedures:

1. [Music & Play]: Sing joyfully and move freely.
2. [Rhythm 1&2]: Listen and clap with the music. Express animated regarding the different tempo of the music.
3. [Animal Song]: Model the motions of each animal exaggeratedly for your child.
4. [Clap Your Hands]: Model the clapping for your child. Touch your child's hand and clap with him/her.
5. [Stop and Go]: Appear surprised when the music stops. You can also use gestures to indicate the pause (silence) of the music.
6. [Marching]: Appear energetic and act like a soldier (or any character you and your child like). Follow the beat of the music and march accordingly.
7. [Relaxation 1]: Tell your child that the music time is going to the end. You can find a comfortable position for you and your child and listen to the music quietly.
8. [Sweet Baby]: Slightly touch your child. Sing to your child with affection and eye contact.

How successful am I?

Did I change my facial expressions during play?

Did I change my tone of voice during play?

Session 3

Objective: Parents will match their child's interests and behavioral styles during musical play.

Music: (1) Singing: Music & Play (2) Singing: What Do You Like? (3) Singing: Let's Do It Together! (4) Listening/Instrument playing: Rhythm 3 & 4 (5) Listening/Instrument playing: Stop and Go 3 & 4 (6) Listening/Instrument playing: Instrument Jam 1 (7) Movement: Dance 2 (8) Relaxation 2 (9) Singing: Sweet Baby	Materials: Shakers Tambourine Hand drum CD player
---	--

Preparations:

1. Put your CD 3 in the player.
2. Prepare some stuffed animals (such as cat, dog, etc.) and hide them in a place that your child won't be able to reach or see.
3. Get your instrument package ready.

Reminders to parents:

1. Get into your child's world, and observe what he/she likes and how he/she acts.
2. During this session, act and play in ways your child can do.
3. Imitate your child occasionally during play.

Procedures:

1. [Music & Play]: Sing joyfully and move freely.
2. [What Do You Like]: Select three things your child likes to do, and incorporate them in the lyrics.
3. [Let's Do It Together]: Sing and act the way your child acts during the song. If you give your child a direction, remember to match his/her developmental level (things he/she can do).
4. [Rhythm 3&4]: Observe how your child plays with the instruments. Imitate the ways he/she plays.
5. [Stop and Go]: Observe how the child ordinarily engages in the music, and match the child's behavioral style. If he/she moves slowly, you move slowly with him/her. If he/she moves fast, follow him/her.
6. [Instrument Jam]: Follow the child's lead while playing the instruments.
7. [Dance]: Follow the child's lead and move freely in the space.
8. [Sweet Baby]: Hold, hug, kiss, and slightly touch your child while singing.
9. [Relaxation 2]: Tell your child that the music time is over. You can find a comfortable position for you and your child and listen to the music quietly.

How successful was I?

Did I match my child's interests?

Did I match my child's behavioral styles?

Session 4

Objective: The parent will play interactively with their child during musical play.

Music: (1) Singing: Music & Play (2) Singing: Let's Go Travel! (3) Listening/Instrument playing: Rhythm 5~9 (Call and Response) (4) Listening/Instrument playing: Stop and Go 5 (5) Listening/Instrument playing: Game 1 & 2 (6) Movement: Marching 2 (7) Relaxation 2 (8) Singing: Baby, I Love You	Materials: Finger doll Shakers Tambourine Hand drum Rhythm sticks CD player
---	--

Preparations:

1. Put your CD4 in the player.
2. Prepare some stuffed animals (such as cat, dog, etc.) or finger dolls, and hide them in the place that your child won't be able to reach or see.
3. Get your instrument package ready.

Reminders to parents:

1. The play involves exchanging messages between parents and children.
2. Remember to communicate less, so children can communicate more.

Procedures:

1. [Music & Play]: Sing joyfully and move freely.
2. [Let's Go Travel]: Sit face-to-face for this finger-play song. Use your fingers to climb on the child's body. Parents can also use a finger doll with this song. Your child can assume the role and do what you just did to him/her.
3. [Call and Response]: Play the drum with the music. Use gestures of "listen" vs. "play" or "your turn" vs. "my turn" during this activity.
4. [Free Drumming]: Play the tambourine or the drum freely with the rhythm you like. Pass the tambourine or the drum back and forth with your child. Your child doesn't have to imitate your rhythm, but you can imitate what your child plays.
5. [Stop and Go]: Move with the music, and stop when it stops. (1) When the song ends, pass one instrument to your child. When the song ends next time, your child passes the instrument back to you. (2) Play instruments cooperatively with your child. For example: your child can strike a mallet on a drum that you are holding. You can hold one rhythm stick and tap it against your child's stick.
6. [Listening Game]: Listen to the tempo change of the music, and move/play accordingly.
7. [Marching]: Mirror the child's acts and movements.
8. [Relaxation 2]: Tell your child that the music time is almost over. You can find a comfortable position for you and your child and listen to the music quietly.
9. [Baby, I Love You]: Hold, hug, kiss, and slightly touch your child while singing.

How successful was I?

Was any verbal exchange between my child and me?

Was any physical exchange (i.e., pass instruments back and forth) between my child and me?

Session 5

Objective: Parents will limit the number of times they direct their children and will wait for their children to initiate an act during musical play.

Music: (1) Singing: Music & Play (2) Singing: Let's Move (3) Singing: Choo Choo Train (4) Listening/Instrument playing: Rhythm 10~14 (Call and Response) (5) Listening/Instrument playing: Game 3 & 4 (6) Listening/Instrument playing: Stop and Go 6 (7) Movement: Instrument Jam 2 (8) Movement: Marching 3 (9) Singing: Baby, I Love You (10) Ending: Relaxation 3	Materials: Shakers Tambourine Hand drum Rhythm sticks Scarf or fabric CD player
--	--

Preparations:

1. Put your CD 5 in the player.
2. Prepare some stuffed animals (such as cat, dog, etc.) and hide them in a place that your child won't be able to reach or see.
3. Get your instrument package ready.

Reminders to parents:

1. Give the child frequent opportunities to make choices.
2. Wait silently for the child to respond.

Procedures:

1. [Music & Play]: Sing joyfully and move freely.
2. [Let's Move]: Verbally direct your child to watch you. You can also imitate your child's acts.
3. [Choo Choo Train]: Let your child determine where the train moves and which stuffed animal to carry on the train.
4. [Rhythm10~14]: Let the child pick an instrument for himself/herself and also for you.
5. [Game 3 & 4]: Listen to the dynamics change of the music, and move/play accordingly.
6. [Instrument Jam]: Let your child pick the instruments he/she likes and follow the child's lead while playing the instruments.
7. [Marching 3]: Let the child wear a special leader hat or hold a baton. Follow the child's lead and alternate the lead.
8. [Baby, I Love You]: Hold, hug, kiss, and slightly touch your child while singing.
9. [Relaxation 3]: Tell your child that the music time is over. You can find a comfortable position for you and your child and listen to the music quietly.

How successful was I?

Did I provide opportunities for my child to make choices?

Did I wait for my child to make a decision?

Session 6

Objective: Parents will learn to interpret the intentions of their children's acts correctly and to respond to their children promptly and frequently.

Music: (1) Singing: Music & Play (2) Singing: I See, You See (3) Listening/Instrument playing: Rhythm 15 & 16 (4) Listening/Instrument playing: Game 5 & 6 (5) Listening/Instrument playing: Stop and Go 7 & 8 (6) Movement: Dance 3 (7) Singing: Baby, I Love You (8) Ending: Relaxation 3	Materials: Shakers Tambourine Hand drum Rhythm sticks CD player
--	---

Preparations:

1. Put your CD 6 in the player.
2. Get your instrument package ready.

Reminders to parents:

1. Observe your child's behaviors constantly.
2. Be sensitive to your child's attention shifting from one object to another.
3. Be sensitive to your child's initiative behaviors.
4. Respond promptly to your child's signals or verbal/nonverbal requests.
5. Respond to your child's unintentional acts as if they are meaningful.

Procedures:

1. [Music & Play]: Sing joyfully and move freely.
2. [I See, You See]: You can replace the lyrics according to the focus of your child's attention on an object. Use pointing gestures to confirm your child's focus or to direct your child's attention to your focus. Incorporate animal cards with the song.
3. [Rhythm 15 & 16]: Let your child pick two instruments for this song. Observe how your child plays with the instruments and translate your child's actions, feelings, and intentions into words. Acknowledge the ways he/she acts and the intentions he/she makes.
4. [Game 5 & 6]: Listen to the style change of the music, and move/play accordingly.
5. [Stop and Go]: Create your own rules about how to react when music stops.
6. [Dance 3]: If your child can express his/her ideas independently, just follow his/her wishes during this activity (without asking). If your child can't express himself/herself, offer him/her two or three choices (such as how he/she wants to dance, or which prop he/she wants to use during the song).
7. [Baby, I Love You]: Hold, hug, kiss, and slightly touch your child while singing.
8. [Relaxation 3]: Tell your child that the music time is over. You can find a comfortable position for you and your child and listen to the music quietly.

How successful was I?

Did I understand the intentions of my child's acts and respond to him/her appropriately?

Did I respond to my child's signals or requests promptly?

Did I respond to my child's signals or requests frequently?

APPENDIX C

PARENT EDUCATION SESSION EVALUATION FORM

Parent Education Session Evaluation

Session 1

Date: _____

Participant ID: _____

Evaluation for parent:

Rate each of the behavior on a 5-point Likert scale.

1 = unable/not comfortable, 5 = capable/comfortable

	Musical Abilities	Score
Activity 1	Does the parent feel comfortable singing?	
Activity 2	Can the parent conduct signing activity independently?	
Activity 3	Can the parent clap different rhythms?	
Activity 4	Does the parent feel comfortable playing instruments?	
Activity 5	Can the parent conduct instrumental playing activity independently?	
Activity 6	Does the parent move freely?	
	Total	/30

Evaluation for child:

Mark "X" if the behavior is observed.

	Visual Engagement	Physical Engagement	Positive Verbalizations
Activity 1			
Activity 2			
Activity 3			
Activity 4			
Activity 5			
Activity 6			
Total	/6	/6	/6

Parent Education Session Evaluation

Session 2

Date: _____

Participant ID: _____

Evaluation for parent:

Rate each of the behavior on a 5-point Likert scale.

1 = never, 5 = most of the time

	Positive facial expressions	Vocal tonality change
Activity 1		
Activity 2		
Activity 3		
Activity 4		
Activity 5		
Activity 6		
	/30	/30

Evaluation for child:

Mark "X" if the behavior is observed.

	Visual Engagement	Physical Engagement	Positive Verbalizations
Activity 1			
Activity 2			
Activity 3			
Activity 4			
Activity 5			
Activity 6			
Total	/6	/6	/6

Parent Education Session Evaluation

Session 3

Date: _____

Participant ID: _____

Evaluation for parent:

Rate each of the behavior on a 5-point Likert scale.

1 = never, 5 = most of the time

	Match child's interests	Match child's behavioral styles
Activity 1		
Activity 2		
Activity 3		
Activity 4		
Activity 5		
Activity 6		
	/30	/30

Evaluation for child:

Mark "X" if the behavior is observed.

	Visual Engagement	Physical Engagement	Positive Verbalizations
Activity 1			
Activity 2			
Activity 3			
Activity 4			
Activity 5			
Activity 6			
Total	/6	/6	/6

Parent Education Session Evaluation

Session 4

Date: _____

Participant ID: _____

Evaluation for parent:

Rate each of the behavior on a 5-point Likert scale.

1 = never, 5 = most of the time

	Verbal exchanges with the child	Physical exchanges with the child
Activity 1		
Activity 2		
Activity 3		
Activity 4		
Activity 5		
Activity 6		
	/30	/30

Evaluation for child:

Mark "X" if the behavior is observed.

	Visual Engagement	Physical Engagement	Positive Verbalizations
Activity 1			
Activity 2			
Activity 3			
Activity 4			
Activity 5			
Activity 6			
Total	/6	/6	/6

Parent Education Session Evaluation

Session 5

Date: _____

Participant ID: _____

Evaluation for parent:

Mark "X" if the behavior is observed.

	Provide choice-making opportunities	Wait for child to initiate or response
Activity 1		
Activity 2		
Activity 3		
Activity 4		
Activity 5		
Activity 6		
	/6	/6

Evaluation for child:

Mark "X" if the behavior is observed.

	Visual Engagement	Physical Engagement	Positive Verbalizations
Activity 1			
Activity 2			
Activity 3			
Activity 4			
Activity 5			
Activity 6			
Total	/6	/6	/6

Parent Education Session Evaluation

Session 6

Date: _____

Participant ID: _____

Evaluation for parent:

Mark "X" if the behavior is observed.

	Observe and interpret child's intentions correctly	Respond to child promptly
Activity 1		
Activity 2		
Activity 3		
Activity 4		
Activity 5		
Activity 6		
	/6	/6

Evaluation for child:

Mark "X" if the behavior is observed.

	Visual Engagement	Physical Engagement	Positive Verbalizations
Activity 1			
Activity 2			
Activity 3			
Activity 4			
Activity 5			
Activity 6			
Total	/6	/6	/6

APPENDIX D

APPROVAL FORMS

Office of the Vice President For Research
Human Subjects Committee
Tallahassee, Florida 32306-2742
(850) 644-8673, FAX (850) 644-4392

APPROVAL MEMORANDUM

Date: 11/14/2011

To: Yen-Hsuan Yang
Dept.: MUSIC SCHOOL
From: Thomas L. Jacobson, Chair

Re: Use of Human Subjects in Research

A music education program for parents of children with developmental disabilities and delays:
An investigation of the effects on parent-child interactions

The application that you submitted to this office in regard to the use of human subjects in the research proposal referenced above has been reviewed by the Human Subjects Committee at its meeting on 11/09/2011. Your project was approved by the Committee.

The Human Subjects Committee has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval does not replace any departmental or other approvals, which may be required.

If you submitted a proposed consent form with your application, the approved stamped consent form is attached to this approval notice. Only the stamped version of the consent form may be used in recruiting research subjects.

If the project has not been completed by 11/7/2012 you must request a renewal of approval for continuation of the project. As a courtesy, a renewal notice will be sent to you prior to your expiration date; however, it is your responsibility as the Principal Investigator to timely request renewal of your approval from the Committee.

You are advised that any change in protocol for this project must be reviewed and approved by the Committee prior to implementation of the proposed change in the protocol. A protocol change/amendment form is required to be submitted for approval by the Committee. In addition, federal regulations require that the Principal Investigator promptly report, in writing any unanticipated problems or adverse events involving risks to research subjects or others.

By copy of this memorandum, the Chair of your department and/or your major professor is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols as often as needed to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Human Research Protection. The Assurance Number is FWA00000168/IRB number IRB00000446.

Cc: Alice-Ann Darrow, Advisor
HSC No. 2011.7066

Parental/Guardian Consent Form

A Music Training Program for Parents of Children with Developmental Disabilities and Delays: An Investigation of the Effects on Parent-Child Interactions

You and your child are invited to participate in a research study that examines the impact of music on parent-child interactions. You and your child were selected as possible participants because we would like to know how music can benefit families of children who are at risk for developmental concerns. We ask that you read this form and ask any questions you may have before agreeing to be in the study.

This study is being conducted by Yen-Hsuan Yang, MM, MT-BC, College of Music at Florida State University.

Background Information: The purpose of this study is to investigate the effects of music on parent-child interactions and the parental use of music with the children.

Procedures: If you agree to be in this study, we would ask you to do the following things: (1) you and your child will actively participate in a music-based training program, (2) you will practice with your child during your child's daily routines, and (3) you will fill out a questionnaire asking what musical abilities you have, what music activities have you used in the home with your child, and how you and your child interact during play. You will be videotaped while playing with your child during and after the music program.

Risks and Benefits: By participating in this study, you may benefit by learning new ways to interact with your child. Additionally, information gathered in this study may lead to progress in the development of innovative home-based music programs for children and families.

Compensation: When you complete all the tasks in this study, a small package of instruments will be given to you as a gift for your participation.

Confidentiality: The records of this study will be kept private and confidential to the extent permitted by law. The results of the research study may be published. Your name or other identifying information will never be used in any written or oral presentation pertaining to this study. Video recordings will only be used for data collection purposes and will not be used outside of the research project. All data collected will only be used to the extent allowed by law and for the purpose of the study as it is described above.

Voluntary Nature of the Study: Your participation, as well as that of your child, is voluntary. Your decision whether or not to participate will not affect your current or future relations with Early Steps. If you decide to participate with your child, you are free to not answer any question or withdraw at any time without affecting those relationships.

Contacts and Questions: If you have any questions concerning this research study, please email me at [REDACTED] or via 122 N. Copeland Ave, 220 KMU, College of Music, Tallahassee, FL 32306-1180. Additional questions can be addressed to Dr. Darrow at aadarrow@music.fsu.edu or by phone at 850-645-1438.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher(s), you are encouraged to contact the FSU IRB at 2010 Levy Street, Research Building B, Suite 276, Tallahassee, FL 32306-2742, or 850-644-8633, or by email at [REDACTED]

FSU Human Subjects Committee approved on 11/10/2011. Void after 11/07/2012 HSC # 2011.7066

You will be given a copy of this information to keep for your records.

Statement of Consent:

I have read the above information. I have asked questions and have received answers. I consent to participate in the study.

I also give consent for my child, _____, to participate in the above study.

Signature

Date

Signature of Investigator

Date

FSU Human Subjects Committee approved on 11/10/2011. Void after 11/07/2012 HSC # 2011.7066

“No effort on behalf of
children is ever wasted.”



November 28, 2011

Yen-Hsuan Yang, MM, MT-BC, NICU-MT
309-07 Pennell Circle
Tallahassee, FL 32310

David A. Bundy
President/CEO
James E. Patrick
Secretary/COO
Robert J. Wydra, Jr.
Treasurer/CFO
Frank D. Gonzalez, Esq.
General Counsel

Dear Mr. Yang:

Congratulations, you have been approved to conduct your research project, "**A music training program for parents of children with developmental disabilities and delays: An investigation of the effects on parent-child interactions**" at Children's Home Society of Florida.

Board of Directors

Victoria Weber
Chair
Martin Rubin
Vice Chair

Richard Adams
Samuel P. Bell, III
Dr. Jacqueline Chang
Charles L. Cromer
Samia Ferraro
Jeff Gordon
Michele Greene
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Dr. Ed H. Moore
Robert Moser
Larisa F. Perry
Sherry Phymale
William D. Preston
Cindy Pullen
Valerie Seidel
Miguel Viyella
Jay Windham

This approval requires that you abide by our Statewide Directive and Policy number 1020. I will remain your contact at the Corporate Office for this project; however you will need to coordinate with the local division: North Central Division and the Early Steps Program Manager Latasha Dullivan to identify potential clients for the study.

We commend you for choosing CHS as your site to perform this research study. We agree that the results will have great relevance to our mission and our desire to retain highly qualified staff.

Once you have completed the dissertation, please provide us with a copy for our records. We would also be interested in any aggregate data that you may be able to share with the two divisions that are participating.

Thank you for your proposal research submission.

Sincerely,

Andy E. Sweet
Vice President of Innovation and Quality Management

Corporate Office

1485 S. Semoran Boulevard
Suite 1448
Winter Park, Florida 32792
Phone: 321.397.3000
Fax: 321.397.3022
www.chsfl.org



Leave a Legacy...Remember Children's Home Society of Florida in your estate planning.

APPENDIX E

RAW DATA

	Parents' Physical Responses				Parents' Verbal Responses		
	Pretest	Posttest	Gains		Pretest	Posttest	Gains
1	7.5	17.5	10.0		30.0	45.0	15.0
2	7.5	12.5	5.0		40.0	52.0	12.0
3	5.0	2.5	-2.5		47.5	50.0	2.5
4	25.0	12.5	-12.5		77.5	65.0	-12.5
5	5.0	7.5	2.5		65.0	67.5	2.5
6	20.0	12.5	-7.5		67.5	77.5	10.0
7	10.0	22.5	12.5		60.0	82.5	22.5
8	10.0	7.5	-2.5		37.5	32.5	-5.0
9	7.5	12.5	5.0		90.0	82.5	-7.5
10	2.5	15.0	12.5		27.5	55.0	27.5
11	5.0	7.5	2.5		37.5	50.0	12.5
12	5.0	22.5	17.5		17.5	45.0	27.5
13	15.0	17.5	2.5		60.0	57.5	-2.5
14	12.5	35.0	22.5		75.0	90.0	15.0
15	17.5	5.0	-12.5		75.0	80.0	5.0
16	15.0	32.5	17.5		65.0	72.5	7.5
17	10.0	15.0	5.0		47.5	47.5	0.0
18	15.0	10.0	-5.0		65.0	77.5	12.5
19	5.0	7.5	2.5		62.5	60.0	-2.5
20	12.5	20.0	7.5		45.0	57.5	12.5
21	12.5	5.0	-7.5		22.5	30.0	7.5
22	15.0	32.5	17.5		70.0	85.0	15.0
23	7.5	15.0	7.5		45.0	40.0	-5.0
24	2.5	7.5	5.0		42.5	77.5	35.0
25	10.0	30.0	20.0		90.0	75.0	-15.0
26	10.0	12.5	2.5		80.0	77.5	-2.5

Children's Physical Initiations				Children's Verbal Initiations			
	Pretest	Posttest	Gains		Pretest	Posttest	Gains
1	12.5	10.0	-2.5		7.5	32.5	25.0
2	20.0	32.5	12.5		25.0	17.5	-7.5
3	32.5	40.0	7.5		15.0	7.5	-7.5
4	47.5	35.0	-12.5		35.0	62.5	27.5
5	5.0	25.0	20.0		52.5	57.5	5.0
6	20.0	27.5	7.5		37.5	25.0	-12.5
7	27.5	22.5	-5.0		37.5	30.0	-7.5
8	20.0	20.0	0.0		32.5	27.5	-5.0
9	32.5	22.5	-10.0		45.0	52.5	7.5
10	7.5	12.5	5.0		5.0	17.5	12.5
11	2.5	0.0	-2.5		2.5	5.0	2.5
12	0.0	7.5	7.5		2.5	12.5	10.0
13	20.0	17.5	-2.5		37.5	27.5	-10.0
14	12.5	25.0	12.5		50.0	55.0	5.0
15	22.5	10.0	-12.5		82.5	92.5	10.0
16	35.0	47.5	12.5		70.0	77.5	7.5
17	15.0	25.0	10.0		25.0	62.5	37.5
18	7.5	12.5	5.0		45.0	67.5	22.5
19	2.5	12.5	10.0		65.0	60.0	-5.0
20	7.5	10.0	2.5		7.5	22.5	15.0
21	12.5	10.0	-2.5		5.0	10.0	5.0
22	12.5	12.5	0.0		17.5	45.0	27.5
23	12.5	10.0	-2.5		27.5	15.0	-12.5
24	10.0	12.5	2.5		47.5	50.0	2.5
25	20.0	17.5	-2.5		82.5	80.0	-2.5
26	10.0	17.5	7.5		60.0	62.5	2.5

Parent-Child Synchrony																					
1	Pre	3	4	4	4	4	3	3	4	4	4	3	4	5	3	1	2	3	3	2	4
	Post	3	3	4	3	2	4	2	3	4	3	3	3	4	4	4	4	5	4	5	5
2	Pre	3	4	4	4	5	4	4	4	5	3	2	2	3	3	4	3	5	3	4	5
	Post	3	4	5	5	4	5	4	5	5	4	5	5	4	5	4	5	5	5	4	4
3	Pre	3	2	1	2	2	4	3	3	3	2	3	3	2	1	3	5	2	5	4	4
	Post	2	3	4	3	3	2	2	3	4	3	4	3	3	5	3	2	2	2	3	2
4	Pre	4	4	4	4	3	4	4	3	2	4	3	2	3	2	2	1	3	3	2	4
	Post	4	5	2	4	2	5	5	4	5	5	4	5	5	5	5	5	4	5	4	4
5	Pre	4	3	3	3	4	4	4	3	2	2	4	3	1	3	3	3	3	4	3	4
	Post	4	1	1	2	3	3	3	4	4	4	3	4	3	3	4	3	2	1	3	3
6	Pre	5	4	5	4	5	5	5	4	5	5	5	5	4	5	5	5	5	4	4	4
	Post	4	5	4	5	5	5	5	5	5	5	4	5	5	5	5	5	4	4	5	5
7	Pre	5	5	5	4	2	5	5	2	4	4	5	1	2	5	3	4	5	3	5	5
	Post	5	5	5	3	4	5	5	5	5	5	4	3	4	4	5	5	4	5	5	5
8	Pre	5	5	3	3	4	4	3	5	3	4	5	5	3	2	4	4	5	4	3	4
	Post	5	5	4	4	3	4	4	5	5	4	3	4	5	5	4	4	4	5	5	5
9	Pre	5	5	5	5	5	5	5	4	5	5	5	5	5	5	5	5	5	4	4	5
	Post	5	5	5	5	4	4	5	4	3	5	5	5	5	5	5	5	5	4	5	4
10	Pre	3	3	3	2	3	2	2	4	2	3	2	3	3	5	3	2	2	2	1	2
	Post	4	5	3	3	3	5	4	5	3	4	5	4	4	5	4	3	4	5	3	4
11	Pre	2	3	3	3	2	2	2	2	2	3	4	3	4	4	3	3	3	3	4	4
	Post	3	3	2	3	3	2	4	4	4	4	3	3	3	3	3	4	4	2	3	4
12	Pre	3	2	3	3	3	4	3	2	2	1	2	1	1	3	3	3	3	3	2	4
	Post	2	2	3	4	4	5	4	4	2	2	5	5	4	4	4	5	1	4	5	5
13	Pre	1	2	3	2	3	2	4	4	3	4	4	2	3	4	4	3	4	4	4	4
	Post	3	4	4	4	4	4	5	4	4	3	2	3	4	3	3	4	2	2	4	4
14	Pre	3	4	4	4	4	5	4	5	4	5	4	5	5	4	4	4	4	4	4	4
	Post	4	4	4	4	4	5	5	5	4	4	5	4	4	5	5	5	5	3	4	3
15	Pre	4	5	5	5	5	5	5	5	5	5	5	5	4	5	5	5	4	5	5	5
	Post	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	5	5
16	Pre	4	4	3	4	3	3	3	4	4	5	5	4	3	4	3	4	3	3	4	4
	Post	4	5	5	4	3	4	4	5	5	5	5	5	4	5	5	5	5	5	4	5
17	Pre	3	3	3	4	3	3	3	3	2	2	3	4	3	2	2	4	3	3	2	2
	Post	3	4	3	4	4	3	1	3	3	4	4	3	3	3	2	3	3	2	2	2
18	Pre	4	3	5	5	5	4	4	4	4	5	5	5	5	5	5	5	4	5	5	5
	Post	5	3	4	4	5	5	5	4	4	5	4	5	5	5	5	5	5	5	5	5
19	Pre	3	4	4	4	5	3	2	4	3	2	4	4	2	4	5	5	5	5	5	5
	Post	5	5	5	5	5	5	4	5	5	4	4	5	5	5	4	5	3	4	5	5
20	Pre	4	4	4	4	3	2	4	5	4	4	4	2	3	3	3	3	2	3	5	4
	Post	5	5	3	2	2	5	3	3	2	2	3	3	4	3	3	3	4	4	5	5
21	Pre	1	3	3	4	4	4	4	4	3	3	3	2	1	2	2	3	4	4	4	4
	Post	4	3	2	3	2	3	3	2	3	4	4	3	4	5	3	4	4	3	1	1
22	Pre	3	4	4	5	5	5	5	4	4	4	4	4	4	4	5	4	3	4	3	3
	Post	4	4	4	5	5	4	5	4	5	4	5	5	5	5	4	4	4	5	5	5
23	Pre	4	3	2	3	4	2	2	3	3	2	2	3	3	3	3	4	4	3	3	4
	Post	4	4	3	4	3	4	4	4	4	4	3	4	5	4	3	4	5	4	4	3
24	Pre	5	5	4	5	5	5	5	4	5	5	5	5	5	5	5	5	4	5	5	5
	Post	5	5	5	5	5	5	5	5	4	4	5	5	5	5	5	5	5	5	5	5
25	Pre	5	5	5	4	5	5	5	5	5	5	5	5	4	5	5	4	5	5	4	5
	Post	5	5	5	5	5	5	5	4	5	3	5	5	4	4	5	5	5	5	5	5
26	Pre	5	5	5	5	5	5	5	5	5	5	4	5	5	5	5	5	4	5	5	4
	Post	5	5	5	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

Questionnaire: The Parental Use of Music & Play - Pretest																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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