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Feasibility and Preliminary Outcomes from a Pilot Study of the SMILE Curriculum for Mother-Infant Co-Occupational Engagement and Maternal Self-Efficacy

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FEASIBILITY AND PRELIMINARY OUTCOMES FROM A PILOT STUDY OF THE SMILE CURRICULUM FOR MOTHER-INFANT CO-OCCUPATIONAL ENGAGEMENT AND MATERNAL SELF-EFFICACY

by

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ABSTRACT

FEASIBILITY AND PRELIMINARY OUTCOMES FROM A PILOT STUDY OF THE SMILE CURRICULUM FOR MOTHER-INFANT CO-OCCUPATIONAL ENGAGEMENT AND MATERNAL SELF-EFFICACY

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OBJECTIVE: To report on the feasibility and preliminary outcomes from a pilot study of the SMILE curriculum, a new educational program designed to enhance the mother-infant relationship by focusing on improvement of co-occupational engagement within daily routines. METHOD: Six mothers, each with an infant diagnosed with special medical needs who received services in a local birth-to-three program, participated in an exploratory design study. Each mother was assigned to a SMILE curriculum intervention group or a waiting-list control group. Mothers were evaluated pre- and post-intervention using the Perceived Maternal Parenting Self-Efficacy (PMP-SE) Scale for measurement of maternal self-efficacy and the Center for Epidemiological Studies of Depression (CES-D) Scale to assess the risk for post-partum depression (PPD). Additional data collection included responses from a phone interview, a demographic survey, and a parent feedback form of the SMILE curriculum. RESULTS: Preliminary outcomes from this pilot study indicate that the SMILE curriculum is a feasible educational program for use in early intervention programs. Although initially designed for use working with mothers in a NICU setting, parental feedback on the SMILE curriculum suggests that this program

may be further adapted for use in an early intervention setting. CONCLUSION: The findings support the need for effective educational programs that enhance the mother-infant relationship in an early intervention setting. Such programs may increase maternal self-efficacy during engagement in co-occupations, especially if the infant has a special need. Further research on the SMILE curriculum in a larger and well-controlled replication study is indicated for assessment in both NICU and early intervention settings.

To my Mom and Dad, I am grateful for all of your love and support

and would not be where I am today without you.

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I. INTRODUCTION

Purpose of the SMILE Curriculum

The purpose of this study was to evaluate the feasibility and preliminary outcomes of the SMILE curriculum. The SMILE curriculum is an intervention program composed of two educational group sessions led by a facilitator. It was originally designed for use with parents and caregivers of post-NICU infants, who are making the transition from a hospital setting to the home environment (Erickson, 2011). The transition from hospital to home is often a challenging time for the caregiver, as they may suddenly feel overwhelmed when taking full responsibility for the first time in caring for their infant. A major transition from hospital to home may lead to a lack of confidence for the caregiver, resulting in many challenging experiences for both parents and infants after arriving home (Erickson, 2011). While the transition from NICU to home is challenging, caring for a child with special healthcare needs can present caregivers with a set of unique circumstances that are equally challenging. It is important to take into consideration that parents may need further assistance during this difficult transition, especially when raising an infant with special healthcare needs. The SMILE curriculum addresses specific issues that may be present in the daily lives of caregivers, especially in regard to the engagement in co-occupations with their infants.

The SMILE curriculum addresses the potential needs of the caregiver by incorporating conceptual practice models unique to occupational therapy. The primary model used for the development of the SMILE curriculum is the conceptual practice model of co-occupation. This model was developed by Pickens and Pizur-Barnekow (2009) and defines co-occupation. A co-occupation can be described as a socially

interactive form of occupation, which incorporates the elements of shared physicality, shared emotionality, and shared intentionality. Co-occupational engagement is the medium for bonding, which affects social-emotional and cognitive development. In addition, the SMILE curriculum was derived from the person environment occupation (PEO) model. The PEO model addresses factors which relate to the individual, the physical environment in which co-occupations are performed, and the social environment as represented by the reciprocal relationship between caregiver and infant in relation to co-occupational engagement (Erickson, 2011, Law et al., 1996). The SMILE curriculum is a novel and innovative intervention that draws upon the model of co-occupation, as espoused by Pickens and Pizur-Barnekow.

Summary of Research Problem

Post-partum depression (PPD) and other maternal mental health concerns can significantly impact the way a mother interacts with her infant. In particular, PPD can be a significant problem in urban neighborhood environments, due to the potential influence of socio-economic status, poor living conditions, and daily life stressors (Thompson & Fox, 2010). Furthermore, a mother's self-esteem may be influenced by the medical status of her infant. It has been found that significant infant health issues may disrupt interactions between mother and infant, leading the mother to experience strong feelings of incompetence and anxiety (Shea & Tronick, 1988).

The quality of the mother-infant relationship may be affected by maternal mental health and if the infant has a disability or other medical issues, especially if the infant has spent time in the NICU. A post-NICU infant requires a significant amount of care to meet his or her physical needs. Often a different dynamic in the mother-infant

relationship may emerge during the interactions a caregiver performs to meet their infant's physical needs. If the mother interacts in a different way to meet the needs of her infant with a disability, the infant may potentially develop a strong dependency. As an infant forms a bond with their caregiver, it is important for the infant to gradually learn how to become more independent and become an occupational being. Using a co-occupational framework could help to avoid this situation and promote healthier parent and infant interactions early on in the child's life (Erickson, 2011).

When considering the many challenges a caregiver may experience while raising an infant with special healthcare needs, it is important to understand various factors that may be significantly impacting the quality and health of the mother-infant relationship. This is especially important for caregivers during engagement in co-occupations that are essential to the developmental trajectory of the infant into childhood. As an intervention program, the SMILE curriculum incorporates the use of a co-occupational framework to help caregivers overcome the many challenges they may experience when attempting to engage in shared occupations with their infant. Additionally, it is important to understand how to best enhance the confidence and competence of a caregiver during the co-occupational experiences with the infant (Erickson, 2011). There is a need for a program that can assist with this process, which indicates that use of the SMILE curriculum as a method for intervention should therefore be considered.

Study Purpose and Significance

As a program designed to improve the mother-infant relationship, the SMILE curriculum focuses on improving daily life interactions involving co-occupations. When considering the possibilities in developing an effective intervention to promote healthy

co-occupational engagement, it is important to understand the complex nature of mother-infant interactions during participation in co-occupations. All factors that may affect both the mother and infant during co-occupational engagement should be examined closely to gain a useful understanding of what problems may be occurring (Olson, 2004). The SMILE curriculum allows caregivers to closely examine their own interactions with their infant in order to understand how to improve such interactions. This learning experience is made possible by the facilitator's effective communication to the caregiver about how to find solutions to caregiving challenges and by allowing the caregiver to communicate their understanding of this knowledge in a meaningful way during the curriculum.

Performing a pilot study to determine the feasibility and potential outcome measures of the SMILE curriculum can be useful to determine if this intervention is an effective way to enhance the quality of caregiver-infant interactions. The curriculum intends to address the challenges faced by caregivers during interactions to "ensure parents are comfortable integrating co-occupational activities into daily routines [which] may prove beneficial to both parent and child" (Erickson, 2011, p. 8). As an intervention used for improvement of co-occupational engagement, the content of the SMILE curriculum has been evaluated by expert early intervention providers, including occupational therapists. However, the feasibility of implementing the program in early intervention settings and the effectiveness of the SMILE curriculum on maternal self-efficacy has yet to be determined. Therefore, this pilot study holds significance for understanding how to promote the performance of healthy co-occupations between caregiver and infant in an early intervention setting. Finding an effective program for

assisting in improving co-occupational engagement for caregivers could serve to strengthen occupational therapy practice. The use of the SMILE curriculum could potentially be implemented in a number of settings, including locations which provide early intervention, NICU, and maternal mental health-related services. The program would ultimately serve to make a positive impact on the development of the infant and the level of self-efficacy and competence experienced by the caregiver.

II. LITERATURE REVIEW

The following literature review will address six main areas of interest: (a) definitions of the term co-occupation, (b) information on attachment theories, (c) the SMILE curriculum, (d) information on infants with special healthcare needs, (e) the significance of maternal mental health, and (f) interventions which address the mother-infant relationship. These main areas of interest form the foundation for understanding the purpose of the SMILE curriculum as an intervention for the population being studied.

The first main topic, defining co-occupation, will describe the history of co-occupation, the model of co-occupation, and research on this concept. The second area of interest on attachment theories will provide background knowledge on the origins of attachment theory and the psychobiological attachment theory (PAT). The purpose of the third topic will be to describe the SMILE curriculum, followed by a description of the program's relationship to the concept of attachment formation. Information provided in the fourth topic, infants with special healthcare needs, will describe the challenges a caregiver may face when raising a post-NICU infant. Following this topic, discussion of maternal mental health will cover information on the background of post-partum depression, the etiology of this condition, and the influence of the urban environment on maternal mental health. The final area of interest, interventions for the mother-infant relationship, will provide information on three studies related to improving the health of the relationship between mother and infant. A summary is then provided to synthesize all of the knowledge that is covered in this review of literature.

Defining Co-Occupation

History of Co-occupation

Acknowledging the history behind development of the term co-occupation is important in order to gain an understanding for how a co-occupational framework is incorporated into the design of the SMILE curriculum. There have been several proposed definitions for the term co-occupation, however, the use of the term co-occupation in relation to its many developed theoretical constructs has continued to be debated (Erickson, 2011). Co-occupation exists on a continuum of social occupations with the most inter-related of these occupations being present at the higher end of the continuum (Zemke & Clark, 1996). These social occupations require more than one person to be involved during participation. Within the social occupation continuum, "the most deeply inter-related social occupations are co-occupations," for which "two or more people must be active agents in the process" (Pickens & Pizur-Barnekow, 2009, p. 151; Zemke & Clarke, 1996). The concept of co-occupation was further elaborated by Pierce (2003), who built upon the ideas presented by Zemke and Clark (1996) by addressing the term as being part of a theoretical framework of occupation (Pickens & Pizur-Barnekow, 2009).

According to Pierce's construction of this theoretical framework, co-occupations can be categorized under a sociocultural dimension of occupation. Within this framework, there is a social continuum under which all occupations may fall depending on the degree of social involvement, which ranges from being entirely interactive to completely solitary (Pierce, 2003). Pierce's version of the term states that "co-occupations are the most highly interactive types of occupation, in which the occupational experiences of the individuals involved simply could not occur without the

interactive responses of the other person or persons with whom the occupations are being experienced" (Pierce, 2003, p. 199).

Pierce's description of the reciprocal and interactive nature found within the concept of co-occupation was further elaborated in relation to the context of the mother-child relationship as described by Olson (2004), who emphasized the significance of participation in co-occupations between the mother and child. According to Olson, both mother and infant contribute specific aspects to a co-occupational experience, including physical, affective, cognitive, and personal skills, which are essential for the growth and development of the child (Olson, 2004; Pickens & Pizur-Barnekow, 2009). The main mother-infant occupations that are a part of daily life focus on a wide variety of basic and socially interactive routines and are considered to be co-occupations (Olson, 2004).

Olson's work was the main influence for the newly proposed definition of co-occupation developed by Pickens and Pizur-Barnekow (2009). Pickens and Pizur-Barnekow operationalized the term co-occupation and encouraged further discussion of the term. This new definition of co-occupation incorporates three main components, including shared physicality, shared emotionality, and shared intentionality. By definition, shared physicality involves the engagement of two or more people with motor behavior that is reciprocal in nature, and the behavior of one individual must have a direct response to the other individual. Shared emotionality happens when one individual displays a reciprocal response to another individual's emotional tone. Shared intentionality occurs when both individuals have a shared intention or purpose during participation in the co-occupation (Pickens & Pizur-Barnekow, 2009).

In contrast to Pierce's proposed definition, which originally indicated that "co-occupations do not necessarily occur within shared space, time, meaning, affect, or intent," Pickens and Pizur-Barnekow (2009) describe the three main components of shared physicality, shared emotionality, and shared intentionality as being temporally linked (Pierce, 2009, p. 203). For performance of a co-occupation, this would require two or more individuals in participation during the same period of time in an interactive manner.

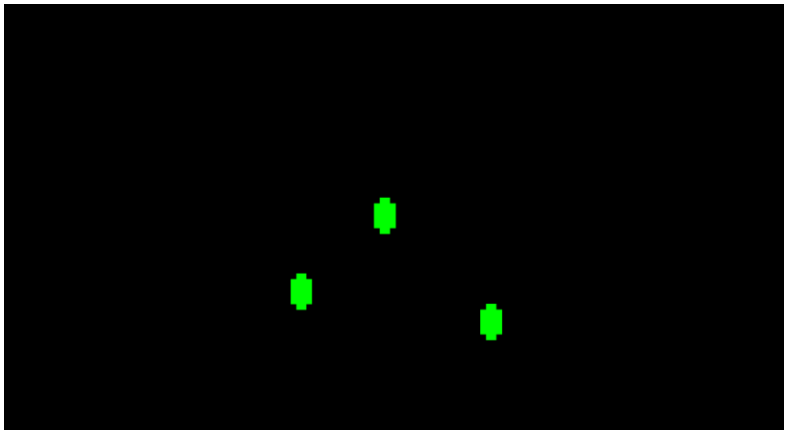
Model of Co-occupation

The content of the SMILE curriculum is based on the model of co-occupation defined by Pickens and Pizur-Barnekow (2009). The model of co-occupation proposes that "co-occupations occur when people perform an occupation in a mutually responsive, interconnected manner that requires aspects of shared physicality, shared emotionality, and shared intentionality" (Pickens & Pizur-Barnekow, 2009, p. 151). This model was presented in order to introduce three propositions relating to the concept of co-occupation.

The first proposition discussed in the model of co-occupation states that a spectrum exists to categorize co-occupations, ranging from the essential to the complex, and the three aspects of shared physicality, shared emotionality, and shared intentionality are used to characterize each type of co-occupation (Pickens & Pizur-Barnekow, 2009). Although there is always an incorporation of these three main aspects, there may be a stronger presence for one particular aspect in comparison to the others. The degree to which a certain aspect is present within a particular co-occupation determines the level of complexity on this co-occupational spectrum (see Figure 1).

Figure 1

Co-occupational Spectrum



For example, the more basic or essential co-occupations, such as a mother breastfeeding her infant, require a higher degree of shared physicality. This is due to the required motor behavior involved with less emphasis placed on shared emotionality or shared intentionality during the process. In contrast to essential co-occupations, more complex co-occupations have a stronger emphasis on all three main aspects and are often defined by the element of mutual responsivity, occurring when the participating individuals demonstrate an understanding of intent and reciprocation of their roles during occupational engagement (Pickens & Pizur-Barnekow, 2009).

Proposition two for the model of co-occupation states that "the nature of co-occupation may be understood through quantitative and/or qualitative means" (Pickens & Pizur-Barnekow, 2009, p. 154). By performing research on co-occupation, which incorporates both quantitative and qualitative means, there becomes a greater understanding of the complexity of co-occupations. Examination of an individual's perspective during occupational performance does not necessarily provide enough information to formulate a thorough description of the experience. There must also be an

understanding of the interaction between individuals during occupational engagement or participation in group-related occupations (Pickens & Pizur-Barnekow, 2009). The use of phenomenology is an excellent example of how qualitative research can be conducted for an understanding of the lived experience during co-occupational engagement. For performing quantitative research on the concept of co-occupational engagement, the Experience Sampling Method (ESM) is often used "to explore the construct of flow experience through random sampling of in-time experience" (Csikszentmihalyi & Larson, 1987; Pickens & Pizur-Barnekow, 2009, p. 154). Both methods when used together can provide in-depth research on the concept of co-occupation from a qualitative and quantitative perspective.

The final proposition for the model of co-occupation states that the manifestation of a co-occupation has the potential to be influenced by the presence of disability or impairment across the lifespan of an individual, while the co-occupation itself may be capable of influencing disability outcomes (Pickens & Pizur-Barnekow, 2009). Just as occupational performance for an individual with a disability has been explored extensively, the influence a disability or impairment on the performance of co-occupations should also be considered a topic worthy of acknowledgment. Thus, this proposition "underscores the reciprocal relationship between impairment or disability and engagement in co-occupation" (Pickens & Pizur-Barnekow, 2009, p. 154). Developing a better understanding of the relationship between disability and co-occupational engagement will allow for the development of more effective interventions that directly address this issue. The SMILE curriculum could potentially be able to address this in order to enhance co-occupational engagement for challenged caregivers and their infants.

Research on Co-occupation

Recent research on co-occupation contributes further insight into how co-occupation functions in the context of an individual. Pizur-Barnekow and Knutson (2009) conducted a study to observe if any differences are present in behavioral and personality characteristics when an individual participated in a solitary activity (solitary occupation) versus a shared activity (co-occupation). This was performed in order to understand how personality and behavior may relate to occupational and co-occupational performance. In contrast to the highly interactive nature of co-occupations, a solitary occupation is performed by a single individual without the involvement of other individuals (Pizur-Barnekow & Knutson, 2009). In this small-scale exploratory study with a repeated measures design, twelve healthy college students between the ages of 19 and 24 were chosen from a convenience sample to participate in both solitary and co-occupations with personality style being measured using the NEO Five Factor Inventory (NEO-FFI). Video recordings of behavior were coded and analyzed using a behavior checklist, resulting in two main categories – physicality and information exchange behaviors. Body language and facial expressions were noted to determine physicality behaviors, while information exchange behaviors were identified by engagement in conversations and any positive or negative remarks that were made. The study reported data relating to the participants playing the game Yahtzee under two separate conditions; as a solitary occupation by playing alone on the computer and as a co-occupation by playing with another person. Results indicated a significant difference when comparing solitary occupation to co-occupation in terms of physicality and information exchange behaviors. However, no statistically significant differences were found for performance

in relation to personality type. This suggests that nature of a solitary occupation may elicit very little motor behavior in comparison to engagement in a co-occupation, which produced a greater number of exchange and physicality behaviors (Pizur-Barnekow & Knutson, 2009).

The results of this study support the model of occupation proposed by Pickens and Pizur-Barnekow (2009) by indicating that the components of shared physicality and shared emotionality are present in co-occupations, as observed by the great number of physical behaviors and greater facial expressions during engagement in co-occupation (Pizur-Barnekow & Knutson, 2009). However, the model of co-occupation's aspect of shared intentionality was not able to be directly measured during this study (Pizur-Barnekow & Knutson, 2009). Overall, this study suggests that behaviors relating to physicality and information exchange may increase during co-occupational engagement and indicate the presence of aspects of shared physicality and emotionality (Pizur-Barnekow & Knutson, 2009).

In another study conducted by Price and Stephenson (2009), a narrative analysis was performed to describe how features of a co-occupation may develop between a parent and their child. Through examination of data discussing the mother-child relationship between a mother and her child with a disability, this article considers how a child's disability may impact a mother's feelings toward engagement in mothering occupations and co-occupations (Price & Stephenson, 2009). Data for this study were collected from another author's previous dissertation work through hand written field notes of observations and audiotaped interviews transcribed into text. These data were analyzed to reveal several themes, including the strengthening of the parent-child

relationship through co-occupational engagement and how co-occupations may lead both participating individuals to grow socially and emotionally (Price & Stephenson, 2009).

Narrative analysis of the data resulted in the following themes: Occupation & co-occupation: Acquiring confidence and competence to manage the child's needs, Promoting the child's occupational development through co-occupation, Promoting social participation with peers, family and friends, and Facilitating the development of their relationship through co-occupation (Price & Stephenson, 2009). These themes described the strategies the mother learned in order promote her child's occupational development and to support the parent-child relationship through engagement in co-occupations (Price & Stephenson, 2009). The child's mother gradually became more confident and competent in her abilities as a caregiver and her relationship with her child began to thrive from an increase in meaningful occupational engagement (Price & Stephenson, 2009). Overall, the results from this study substantiate how the "occupations and co-occupations of parenting are central to providing opportunities and optimizing potentials of children," and how the value of a healthy mother-child relationship should not be underestimated when providing strategies and interventions to address issues related to co-occupational engagement (Price & Stephenson, 2009, p. 185).

Attachment Theories

Origins of Attachment Theory

It is widely accepted that the cognitive and social-emotional development of the child is related to the mother—infant bond (Olson, 2004). Because the concept of attachment has a strong relationship to the principles found within the SMILE curriculum, a background on attachment theory should be taken into consideration. For a

brief summary of attachment, a table on the main principles of attachment theory is presented in Table 1.

From his studies on the impact of mother-child separation, John Bowlby founded the origins of attachment, describing the concept of attachment as warm and nurturing. For an infant to experience healthy development and well-being beginning in the early years of life, a warm and intimate kind of relationship between mother and child should develop that is enduring (Bretherton, 1992). Bowlby used this knowledge to develop his theory of attachment. According to his theory, an infant will begin to seek close proximity to an attachment figure for evolutionary protection from danger. The primary caregiver remains consistently responsive to the infant's needs by engaging in frequent social interaction (Bretherton, 1992). However, if the infant experiences significantly limited interactions with a primary caregiver, a strong attachment between infant and caregiver may not be formed (Ainsworth, 1979).

Table 1

Main Principles of Attachment Theory

Attachment Theories of Bowlby (Bretherton, 1992) and Ainwsorth (1979)	Psychobiological Attachment Theory (PAT) (Barnekow & Kraemer, 2005)
Attachment: Occurring between mother and child and described as warm, nurturing, and enduring.	**Maternal-Infant Bonding:** Adaptive mechanisms at birth which foster attunement to a caregiver with reciprocal interaction between caregiver and child
Evolutionary Purpose: Infant seeks proximity to attachment figure for protection from danger	**Developmental Purpose:** Early social experiences play a role in the formation of neural connections
Security Theory: Attachment figure is a secure base for the infant	**Psychobiological Regulation:** Caregiving regulates a child's physiology, neurobiology, and behaviors
Maternal Sensitivity: Positive and consistent response to an infant's signals	**Homeostatic Regulation:** Establishing a routine for eating, sleeping, and wakefulness
Secure Attachment: Formed by a high level of maternal sensitivity in response to infant's signals	**Socio-Cultural Factors:** A cultural variety of caregiving styles influence reciprocity
Insecure Attachment: Formed by low level of maternal sensitivity without consistency in responses to signals	**Social-Emotional and Cognition:** A child's social abilities, level of emotional reactivity, and signaling behavior influence attachment

In contribution to Bowlby's work, the early work of Mary Ainsworth focused on understanding the security theory (Bretherton, 1992). Ainsworth formulated the concept of "the attachment figure as a secure base from which an infant can explore the world" and demonstrated the importance of how maternal sensitivity in response to an infant's signals is significant for successful formation of attachment (Bretherton, 1992). If the mother does not respond to her infant's signals with consistency and sensitivity, it is less

likely that a mother will be perceived as a secure base by her infant. This may result in formation of an insecure attachment (Barnekow & Kraemer, 2005; Coyl, Roogman, & Newland, 2002). In emphasis for the support of secure attachment, a mother's level of sensitivity in response to her infant was thought to play a significant role in the development of a securely attached infant (Bretherton, 1992).

Psychobiological Attachment Theory

As an extension of Bowlby's theory of attachment, the psychobiological attachment theory (PAT) stresses that consideration for the relationship between the caregiver and child should be equally as important as the child's development, especially during intervention planning in clinical practice (Barnekow & Kraemer, 2005). Therefore, the PAT addresses both the child's and caregiver's contributions to the relationship, and this is considered within the context of the infant-caregiver system. The main concepts of this theory include maternal-infant bonding, neural plasticity, psychobiological regulation, homeostatic regulation, and socio-cultural factors (Barnekow & Kraemer, 2005).

According to the PAT, maternal-infant bonding describes the "adaptive mechanisms at birth [which] foster attunement to a caregiver" (Barnekow & Kraemer, 2005, 6). Another important concept to consider is a child's high degree of neural plasticity occurring within a social context. Forming the main purpose of attachment, early social experiences play a role in the formation of neural connections within the child's nervous system. Psychobiological regulation is another factor to consider within the caregiver-child system. A child's physiology as well as neurobiology and behaviors are regulated by the act of caregiving, especially during daily routines a caregiver may

perform on a consistent basis. Another significant concept present in the PAT is homeostatic regulation, which can be described as "establishing a routine for eating, sleeping, and wakefulness," which occurs "during the first months of a child's life" (Barnekow & Kraemer, 2005, p. 8). If a child experiences a dysfunction in homeostatic regulation, this may result in challenges with maintaining a healthy caregiver-infant relationship. Socio-cultural factors also have great influence on caregiver-child reciprocity, due to many different caregiving styles which are present within various cultures (Barnekow & Kraemer, 2005).

The social aspect present in the PAT is relevant to the attachment process because a child's awareness of his or her own social identity may develop from understanding relationships to other people. Learning how to carefully read a child's signals can help the caregiver to form a healthy attachment to their child during interactions. Emotional and coping factors can impact a child's formulation of attachment to their caregiver, depending on how the child reacts to certain situations. Being aware of how a child reacts emotionally to certain environments and situations can help the caregiver learn how to make any necessary changes to promote healthier coping strategies for his or her child. Cognitively, a child may display signaling behavior, such as gesturing and vocalizing to the caregiver as he or she learns to understand the gestures of the caregiver in response to signal behaviors. Identification of the child's specific signaling strategies may help promote more successful caregiver-child interactions if cognitive development is impaired. Shared meaning may begin to develop during social interactions, leading to a growth in cognition and a healthier form of attachment (Barnekow & Kraemer, 2005).

The SMILE Curriculum

The SMILE curriculum was originally developed for use in a group or in an individualized format using a quick-guide for program delivery. However, adaptations to the program's format were made for this current study (see Appendix A for EI Individualized Protocol). Because the SMILE curriculum uses a co-occupational framework following the model of co-occupation developed by Pickens and Pizur-Barnekow (2009), the presence of caregiver-infant co-occupations is heavily incorporated into the curriculum sessions. Active engagement of the caregiver and infant as well as the significance of remaining responsive to the infant's needs during co-occupational performance are both emphasized in the SMILE curriculum. The facilitator begins discussion by teaching the caregiver about shared activities between mother and infant and this leads into further instruction on the modules of the program, all of which relate to learning how to improve participation in co-occupations during the caregiver's daily routine. The SMILE curriculum includes five modules delivered over two sessions (Erickson, 2011).

The first module 'S' is introduced by the facilitator as Safety and other basic needs. Having an infant with special needs may cause the mother to feel overly concerned for his or her safety, especially during participation in activities, with limited confidence in how to ensure that her infant is safe. The 'S' module discusses this issue in order to help address the safety and basic needs of the infant prior to engagement in co-occupations and offer the parent some structured steps to practice for reducing anxiety during interactions (Erickson, 2011).

Following this module, the 'M' module, defined as Matching developmental levels, is discussed to educate the participants about "how to appropriately match activities to their child's age or developmental readiness," especially when taking into consideration that their infants may not necessarily be at the same developmental level as expected for their age (Erickson, 2011, p. 9). The mother is educated on the importance of recognizing her infants' cues to know whether or not the infant is prepared to engage in an activity. The facilitator instructs the parent on how to perform a basic activity analysis to benefit her understanding of how to best incorporate co-occupations into daily routines within the home (Erickson, 2011).

Considered a main focus for the SMILE model, the 'I' module, which stands for Interactive, is the last module discussed in the first session of the curriculum. In discussion for this module, the facilitator encourages the mother to try engaging in shared activities with her infant and incorporate the information from the first curriculum session into performance of these interactions. As an interaction homework assignment, the mother is asked to choose an activity to try with her infant between the first and second session of the curriculum program and observe how her infant reacts to engagement in the given activity (Erickson, 2011).

During the second session of the SMILE curriculum, the facilitator encourages the mother to share how performance of the interaction homework assignment went by discussing her infant's reactions. The 'L' module refers to Looking for cues and is presented as a continuation from the content taught during the first session. The parent is asked to discuss the major cues that were identified during interactions to determine whether or not the cues indicated enjoyment or distress during the activity. Discussion of

activity analysis is taken a step further to understand how to upgrade or downgrade shared activities in order to modify interactions to meet the infant's particular needs (Erickson, 2011).

The final 'E' module refers to Expecting challenges and successes, during which the facilitator explains that the initial experience of challenges when trying out new shared activities with the infant is to be expected. The mother is encouraged to focus on her infant's successes, however small, during their interactions, rather than dwelling on the potential negatives that may arise when initiating an activity with her infant that does not appear to go well. Following discussion of this module, the facilitator briefly reviews the content of the curriculum and requests the parent to complete a feedback form about how beneficial they felt the SMILE curriculum was for them and how the program could potentially be improved (Erickson, 2011).

Attachment and the SMILE Curriculum

The main focus of the SMILE curriculum is to teach caregivers how to successfully engage in co-occupational performance with their infants, which shares a strong relationship to the formation of attachment (Erickson, 2011). Bowlby viewed attachment as a warm and nurturing experience provided by the caregiver remaining responsive to the infant's needs. The SMILE curriculum serves the purpose of addressing how to develop a supportive caregiver-infant relationship with a high level of sensitivity and responsiveness.

The curriculum protocol indicates that parents must have a clear understanding about how to interact with their infant successfully during co-occupational performance. In Bowlby's theory of attachment, he describes the concept of instinctual responses,

which have a strong relationship to the concept of co-occupation. He noted that several interactions an infant may initiate, such as an infant's sucking, clinging, smiling, and crying, are involved in the promotion of caregiver-infant attachment (Bretherton, 1992). The performance of co-occupations is heavily emphasized during SMILE curriculum sessions as contributing to the formation of the mother-infant bond, which closely follows the principles in Bowlby's theory of attachment (Bretherton, 1992).

In attachment theory, a mother's ability to remain sensitive and responsive to the needs of her infant will allow the infant to feel safe and secure. According to Ainsworth, maintaining this secure base for attachment will promote an infant's exploration of his or her environment (Bretherton, 1992). This is an important concept within the instruction provided by the SMILE curriculum, as highlighted in the instructional component described as safety and basic needs. In order for an infant to successfully engage in co-occupations, the caregiver must first make sure the infant feels comfortable in his or her environment by ensuring that basic needs and sense of safety have been met. Maternal sensitivity is also relevant to the curriculum's instruction on how to match the developmental level of the infant to activities that are chosen during interactions. For an infant being discharged from the NICU, he or she may not necessarily be at the same developmental level as his or her peers. Therefore, remaining sensitive to an infant's particular needs is essential (Erickson, 2011).

The SMILE curriculum emphasizes the need for caregivers to look for cues as to whether or not their infant is enjoying an activity or is in a state of distress during interactions. During the curriculum, the caregiver is guided through discussion on how to identify an infant's signals and know when to engage in shared activities together

(Erickson, 2011). This high level of awareness and maternal sensitivity a caregiver is taught how to achieve can significantly impact the quality of attachment that is formed during engagement in co-occupations (Erickson, 2011). Therefore, this is definitely an important topic to be covered during SMILE curriculum instruction to promote healthy caregiver-infant attachment.

The psychobiological attachment theory (PAT) has a significant relationship to the content of the SMILE curriculum. This theory stresses that the caregiver-infant relationship be equally important as the development of the child, for a mother should feel competent in her ability to remain sensitive and responsive to the needs of her infant in order to promote successful attachment (Barnekow & Kraemer, 2005). The SMILE curriculum addresses this topic by teaching caregivers how to design and adapt shared activities for their infants in order to ensure a high level of competence and confidence in their caregiving abilities (Erickson, 2011). These newly-developed strategies resulting from intervention not only enhance the caregiver-child relationship but also serve to promote healthy attachment between caregiver and infant.

Another important component discussed in the SMILE curriculum is the process of interacting with the infant. This is relevant to the concept of maternal-infant bonding as indicated in the PAT, for which maternal-infant bonding can be described as "the adaptive mechanisms at birth [which] foster attunement to a caregiver" (Barnekow & Kraemer, 2005, p. 7). The SMILE curriculum sessions focus on encouraging the mother to engage in interactions with her infant to promote maternal-infant bonding, which includes a period of time between sessions for caregivers to practice strategies for interaction. During the intervention, the mother is instructed on how to integrate shared

activities into daily routines to benefit both her and her infant (Erickson, 2011). The establishment of a daily routine for the caregiver is emphasized in the PAT through the discussion of psychobiological regulation. Homeostatic regulation, in particular, has a close relationship with the establishment of an effective daily routine to care for an infant, which can have an impact on the development of attachment. The caregiver has a great impact on an infant's daily routine through initiation of patterned events (Barnekow & Kraemer, 2005). The SMILE curriculum emphasizes how the mother can incorporate co-occupations with her infant into her daily routine in order to maintain a healthy caregiver-infant relationship during attachment formation (Erickson, 2011).

In description of the PAT, reference is made to how a child with a disability may not outwardly display social expressions in the same way as the caregiver would expect them to during interactions. If dysfunction may be present, it is important to identify and teach the caregiver alternative strategies for accurately reading their infant's signals. Remaining aware of and reading an infant's signals during interactions can have a positive impact on the development of social attunement and the formation of attachment (Barnekow & Kraemer, 2005). In the SMILE curriculum, the facilitator encourages the mother to discuss her infant's reaction to the shared activity that was tried in between sessions. A mother may often misinterpret her infant's reaction as being negative in response to a particular activity, and as a result "it seems intuitive to parents to discard an activity that seems to bring discomfort or distress to their baby" (Erickson, 2011, p. 11). The facilitator emphasizes that the reactions an infant displays during interactions may not always be what a caregiver would expect to observe. By looking for appropriate cues, caregivers can learn how to modify certain activities to receive a more positive

response from the infant. This serves to improve overall co-occupational engagement and the formation of a secure attachment with their caregiver (Erickson, 2011).

Infants with Special Healthcare Needs

Parents who raise infants with special healthcare needs may experience significant challenges with co-occupational engagement, especially if the infant has recently been discharged from the neonatal intensive care unit (NICU). The SMILE curriculum was originally designed for use in this population. After their infant is admitted to the NICU, parents may experience a high level of stress and anxiety due to concerns for their infant's complex medical needs, resulting in healthy parent-infant bond formation (Sneath, 2009). Most specifically, the birth of a premature infant may place parents in a new and unfamiliar situation, coping with the uncertainty of their infant's health outcomes, and learning how to assume care for their infant during the transition to home (Bakewell-Sachs & Gennaro, 2004).

Following discharge, infants who are post-NICU may still present many health challenges (Erickson, 2011). The infant may often demonstrate short- or long-term developmental problems, differences in behavioral responses, and dysfunctional sleep-wake patterns. Responses during interactions may be less predictable and more difficult for caregivers to interpret in comparison to the responses that are normally initiated by infants. These challenges encountered following discharge may have a significant impact on the confidence of parents. Parental confidence in caregiving abilities is primarily influenced during the time their infant spends in the NICU. This is the same period of time when parents are more likely to experience stress and anxiety. At the time of discharge, the presentation of parental stress and anxiety is especially high but these

feelings may last as long as two years after their infant's birth. This may further impact parental confidence and competence during caregiver-infant interaction (Bakewell-Sachs & Gennaro, 2004).

Assuming full responsibility for the care of their infant is often a great concern for parents at the time of their infant's discharge from the NICU. This is especially true in regard to monitoring their infant's medical status and performing all care procedures at home, while attempting to balance these responsibilities with all of the other parental duties required in the family environment (Sneath, 2009). Discharge from the NICU may be considered an exciting time for families. However, assuming new responsibilities may also feel overwhelming, creating "a stressful transition for families as they assume care for infants who until that day required 24-hour care by teams of highly skilled professionals" (Sneath, 2009; Bakewell-Sachs & Gennaro, 2004, p. 398). In response to this new and overwhelming parental responsibility, an important question to be answered is "Do parents feel that they have been properly prepared and taught to safely and confidently care for their child at home?" (Sneath, 2009, p. 238). During this period of transition, parents have often reported that many of their questions go unasked. Typically, there is great excitement during the time of their infant's discharge from the NICU, resulting in the limited questioning from parents about caring for their infant at home (Sneath, 2009).

Unanswered questions and limited information indicate that this area of healthcare practice must be improved to allow an easier transition for parents during the discharge process and that the information given to parents prior to discharge be more comprehensive (Sneath, 2009). Providing enough initial information to help parents

learn how to navigate the NICU environment, while gradually providing more detailed information on successful care for their infant in the home environment is therefore essential (Bakewell-Sachs & Gennaro, 2004).

In order to successfully provide enough information to parents, it is useful to adopt "family-centered care principles…including support for the development of the parental role" as well as "promotion of the parent-infant relationship and family involvement in the infant's care" (Gibbs, Boshoff, & Lane, 2010, p. 55-56). Use of a family-centered approach allows families to feel more supported and encouraged to make decisions about their infant's health care and may lessen any experienced parental stress and anxiety (Gibbs et al., 2010). During this time, the provision of care should be understood from the parents' point of view to determine whether or not strategies for information delivery are being effective and to ensure that the infant is receiving care that is helpful to their unique situation (Sneath, 2009). To maintain the family-centered approach after discharge, healthcare providers in the NICU should be responsible for "assessing community health resources and facilitating communication and referrals so there are no gaps in care or services at the time of discharge" (Bakewell-Sachs & Gennaro, 2004, p. 402).

Within the family-centered care approach, there is concern for the impact of the NICU setting on parenting occupations, which can be addressed by an occupational therapist (Gibbs et al., 2010). In the NICU, an occupational therapist typically focuses on "preparing parents for interaction with their infant [and] early identification and implementation for supportive practice and/or intervention for infants" with follow-up assessments (Gibbs et al., p. 56). Parenting is considered a significant occupational role

that must be assumed by the caregivers of NICU infants. When providing family-centered care, it is important to understand how parents feel about their own experiences navigating the NICU in relation to what is required of them when assuming the role of a parent to support infant's unique needs. By maintaining focus on the needs of the parents, the importance of occupational performance for both infant and parent can be further supported during intervention (Gibbs et al., 2010).

The Person-Environment-Occupation (PEO) model remains a useful framework for addressing the occupational performance of parents within the NICU environment (Gibbs et al., 2010; Law et al., 1996). The PEO Model offers a way for healthcare providers to examine and understand how the infant and the family learn to respond and accommodate to their own experiences in the NICU (Gibbs et al., 2010). Within the NICU, the physical and social environments in relation to both the parent and infant demonstrate a significant impact on the provision of family-centered care. In examining the PEO Model, the person "in this context may relate to both the infant and the family caregivers which can include the mother and father and the preterm infant, both individual and as a dyad" (Gibbs et al., 2010, p. 58).

The environment of the NICU may be stressful and over-stimulating for a preterm infant, resulting in disruption of self-regulation. As parents try to establish opportunities to engage in interactions with their infant, this disruption of self-regulation may create challenges to successfully do so (Gibbs et al., 2010). During visits to the NICU, parents are likely to experience environmental stressors from witnessing "the infant's appearance and behavior, staff behavior and communication, the sights and sounds of the environment and alteration of parental role" (Gibbs et al., 2010, p. 58). These stressors

may create a barrier, which prevents the parents from being able to readily engage with their infants in this setting (Gibbs et al., 2010). There are many PEO transactions relating to the environment present in the context of the NICU that may impact occupational performance for both infant and parent. For example, the intensive medical support an infant requires in the NICU demonstrates an occupation-environment transaction with the physical barrier of medical equipment limiting occupational engagement between parent and infant. The visiting hours and NICU regulations that may conflict with a parent's ability to participate in caregiving for their infant may create a person-environment transaction (Gibbs et al., 2010). A person-occupation transaction may also occur as a result of "the management of the infant's fragile medical status during caregiving," which forms a significant barrier to engagement in occupations (Gibbs et al., 2010, p. 61).

Following the concept of PEO Model transactions leads to identifying those barriers that prevent engagement in interactions between parent and infant. In identifying these barriers, the concept of co-occupation comes into focus, as there is often great concern about the relationship between infant and mother, especially following hospital discharge. After NICU discharge, the parents may face challenges relating to basic caregiver-infant interactions. These challenges, which may include handling, feeding, or engaging in shared activities, have the tendency to limit the level of parent-infant intimacy. Performance of these caregiver-infant interactions is significant to developing a healthy relationship between parent and infant. A parent and infant should be in the process of developing a social relationship, as the parent begins to learn how to read and respond to their infant's specific cues for easier guidance through common caregiving tasks (Bakewell-Sachs & Gennaro, 2004).

Due to limited possibilities for co-occupational engagement in the NICU, parents may experience anxiety and fear upon discharge. These fears create further problems in learning how to best participate in co-occupations within the home environment (Sneath, 2009). The NICU environment may additionally impact a parent's sense of identity in relation to the occupational role of being a parent. An impact on identity may be due to limited opportunities for participation in the kinds of shared caregiving activities a parent typically performs, which may be part of their previously imagined parental identity. This loss of co-occupational participation that is "important to individuals can erase perceptions of capability and competence" (Gibbs et al., 2010, p. 60). There is an increased focus on the provision of developmental care in the NICU. This type of care is often provided by nurses during the discharge process, who offer their support by educating parents on handling and caring for their infants and also identify if the parents feel prepared and ready for discharge (Bakewell-Sachs & Gennaro, 2004). During provision of these services, "parents are more routinely receiving information about their infant's behavioral cues and how to respond to these cues in soothing interactions with their infant" (Bakewell-Sachs & Gennaro, 2004, p. 400). Providing information on behavioral cues and responses has been found to reduce a parent's stress and anxiety while improving caregiving confidence and may enhance the process of developing healthy participation in co-occupations (Bakewell-Sachs & Gennaro, 2004).

Maternal Mental Health

Post-partum Depression

In addressing how to improve the mother-infant relationship as it relates to co-occupations, the presence of maternal depressive symptoms may impact her ability to

successfully interact with her infant in a positive manner. Post-partum depression (PPD) is recognized as a prevalent condition that may be experienced by an estimated 10-15% of women, with an onset of depression occurring four weeks after birth of the infant (American Psychiatric Association, 2000; Thompson & Fox, 2010). However, the condition may occur anytime within the first year following childbirth (Thompson & Fox, 2010).

Several PPD symptoms may significantly impact the health of the mother-infant relationship. A mother with symptoms may exhibit a decrease in emotional expression and in responses to her infant, accompanied by less eye contact and speech that is produced at a slower rate. A distinct disruption in mother-infant synchrony may result if the depressed mother's responses to the needs of her infant remain consistently delayed. This disruption may also result from a decrease in attention or vocalization of the mother and failure to provide an optimal level of stimulation and affectionate touch to her infant (Thompson & Fox, 2010). A mother's experience of poor emotional health can potentially result in the display of less maternal responsiveness and sensitivity, which may cause a significant impact "if a mother experiences poor psychological health secondary to the birth of an infant at high risk" (Pizur-Barnekow, 2010, p. 642). This may result in lower quality mother-infant interactions and a negative influence on development (Pizur-Barnekow, 2010).

Etiology

To understand the etiology of post-partum depression, there are several risk factors relating to development of the condition. Additionally, the mother-infant relationship can be influenced by "a complex set of interacting individual, social, and

ecological factors that shape developmental outcome" for the infant (Thompson & Fox, 2010, p. 249). When a mother gives birth to an infant with "low birth weight, poor motor functioning, neonatal irritability and prematurity" or experiences a high-risk pregnancy, the risk for developing PPD becomes significantly greater (Thompson & Fox, 2010, p. 250). In particular, when an infant is born prematurely, which can be a common problem, this "produces maternal feelings of failure along with feelings of anxiety and guilt" (Shea & Tronick, 1988, p. 103). Even when an infant presents with a minor or temporary illness, this may result in significant maternal anger and anxiety, especially if the illness causes a temporary separation of mother and infant, while the infant is still sick (Shea & Tronick, 1988).

External social factors may potentially present a risk for development of PPD in new mothers. In order to accommodate for the time and effort that is necessary to care for her new infant, a woman may find herself redefining her relationships with family and friends (O'Hara, Stuart, Gorman, & Wenzel, 2000). Relationship factors form an added stress in terms of psychosocial adjustment to motherhood and may increase the risk for PPD symptoms if there are a significant amount of stressful life events experienced by the mother. Other contributing factors may include a more limited and less satisfying social support system, low family income, and the experience of low self-esteem (Thompson & Fox, 2010).

A woman's newly acquired role as a mother holds great significance when considering the occupational risk factors associated with PPD. This may be due to "the widespread myth that motherhood is instinctive, easy and joyous [and]… as a result, the demands of a new mother's role are often not recognized" by the individuals closest to

her in her social support system (Meager & Milgrom, 1996, p. 851). Thus, the mother may begin to internalize her negative feelings toward motherhood and experience guilt and self-blame. She may attribute this experience to a perceived inability to cope and maintain the energy level required to fulfill her role as a mother (Meager & Milgrom, 1996). Attributing these challenges in raising an infant to herself may result in an unstable transition to the occupational role of motherhood, which may increase the risk for diagnosis of PPD. In contrast, it has been found that "women who adjust their personal goals to align with the demands of each stage of the transition into motherhood have a decrease in depressive symptoms" (Thompson & Fox, 2010, p. 250). As a secondary occupation for mothers raising their infants, women who hold a job express a greater interest in their infants in comparison to those mothers who are not working and experiencing symptoms of depression. This suggests that the lack of a work occupation in the life of a mother may further impact diagnosis of PPD (Thompson & Fox, 2010).

The Urban Environment

The characteristics of an urban neighborhood and its impact on residents within the community may have a strong influence on maternal mental health. The high rate of poverty in urban neighborhoods remains one of the most significant characteristics influencing mental health for those residing in this environment. Research has demonstrated a "positive association between poverty and mental health problems [which] is one of the most well established in all of psychiatric epidemiology" (Belle, 1990, p. 385). When focusing on the effect family poverty has on mental health, there is a specific "association between poverty and greater psychological distress and depression" (Klebanov, Brooks-Gunn, & Duncan, 1994, p. 442). Families experiencing

poverty may often experience more stressors on a daily basis and this accumulation of stress has the potential to weaken the ability to continue coping with subsequent stress (Klebanov et al., 1994). In addition, the high rates of crime often present within an urban neighborhood environment may be influential on mental health. The sustained fear of crime itself for individuals living in an urban environment may be the main source of the influence. The presence of crime has an association with the deterioration of mental health in this population, most specifically for higher rates of depression and anxiety (Taylor, Perkins, Shumaker, & Meeks, 1991).

Women living in poverty may have higher stress levels due to the experience of more uncontrollable life events. These experienced "stressors in important life contexts mediate the link between the demographic variable of low income and psychological variable of depressive symptoms" (Belle, 1990, p. 386). The mental health of a woman living in poverty may be especially impacted when also taking on the role of a mother, for those "women who live in financially strained circumstances and who have responsibility for young children are more likely than other women to experience symptoms of depression" (Belle, 1990, p. 385). In particular, the environmental context created by an individual's low socio-economic status is a significant characteristic found within an urban neighborhood setting, for which the prevalence of PPD in low-income populations has been estimated to be between 23 and 52% (Thompson & Fox, 2010). Various socio-economic factors, which may be characteristically present in an urban environment, including "low education, low income, being unmarried, and being unemployed" have been shown to increase "the risk of developing postpartum depressive symptoms" (Goyal, Gay, & Lee, 2010). Even expressing "more negative maternal

perceptions of the adequacy of income for meeting familial needs" may be related to higher risk for post-partum depressive symptoms (Beeghly, Olson, Weinberg, Pierre, Downey, & Tronick, 2003). It should also be noted that although a disproportionate amount of mothers of low socio-economic status tend to be African American, this confounding factor of race/ethnicity is not associated with an increased risk for PPD (Beeghly et al., 2003).

Within an urban neighborhood setting, the stressors present in this environment may also present an indirect influence on childhood outcomes (Wandersman & Nation, 1998). If a woman is experiencing any type of psychological distress, the resulting parenting behaviors may be poor or impaired when raising her children (Klebanov et al., 1994). Most specifically, for single mothers raising children with limited assistance, the factor of lower socio-economic status "compounds risk in outcomes for children because the depression it causes in single parents leads to the worsening of parenting" and a child's experience of less maternal warmth (Klebanov et al., 1994; Thompson & Fox, 2010, p. 251). Infant developmental outcomes may also be strongly influenced by various maternal predictive factors associated with living in an urban neighborhood, such as the mother maintaining more rigid beliefs, attitudes, and values regarding her parenting style and her perspective on child development (Thompson & Fox, 2010).

Because this proposed study will took place in the city of Milwaukee, the association between familial poverty and maternal depression as well as how this may influence developmental outcomes in children should be heavily noted. The presence of these factors in an urban neighborhood may result in high levels of depression among women in this population who participate in the SMILE curriculum. In 2010,

"Milwaukee's poverty rate was 29.5%...up from 27% in 2009" and "in all, 171,521 people – including nearly half the city's children – lived below the poverty line in 2010 as Milwaukee remained among America's 10 most impoverished big cities" (Tolan & Herzog, 2011, p. 1). As the number of individuals living in poverty continues to grow in the city of Milwaukee, there may be an observed impact for those living in urban neighborhoods, due to the potential for higher rates of diagnosed mental health conditions. This may be especially true for mothers raising children in this setting.

Interventions for Mother-Infant Relationship

Identifying and addressing issues related to the health of the mother-infant relationship is significant to the purpose of the SMILE curriculum. Improving this relationship is helpful for enhancing the performance of co-occupations between mother and infant. Therefore, it is important to gain an understanding of interventions which focus on addressing the quality of interactions between mother and infant. Previously researched interventions which address this issue include infant communication education, a video and discussion education program, and an individualized family-based intervention. Principles found within these interventions are strongly related to the SMILE curriculum.

Infant Communication Education

Infant communication education is a video-based intervention, which focuses on improving the mother-infant relationship, during which mothers have the opportunity to view a 45-minute videotape, which discusses the states, communication cues, and behaviors of infants (Leitch, 1999). The basis for this intervention is that "if the caregiver reads and responds contingently to the infant, the infant develops effective

reciprocal interactions with the caregiver" (Leitch, 1999, p. 55). The purpose of a study performed by Leitch (1999) was "to examine the effect of infant communication education presented prenatally to first-time mothers on the quality of interaction that occurs between the mother-infant dyad in the first 24 hours following birth" (Leitch, 1999, p. 55).

During this study, a total of 29 participating mothers were randomly assigned to either an intervention or control group. Mothers in the intervention group participated in the infant communication education program two weeks prior to their expected due date, while those mothers in the control group participated in several teaching sessions about basic infant care (Leitch, 1999). Following intervention, specific mother-infant interactions, involving the caregiver teaching the infant a sensory motor task, were videotaped and scored by blinded raters. Results indicate a significant effect for the intervention program, suggesting that the infant communication program intervention helped to facilitate successful early mother-infant interactions (Leitch, 1999). However, future research is necessary to determine if the program would still be effective with educational information retained in the long-term following the immediate postpartum period.

Video and Discussion Education Program

Another intervention for the mother-infant relationship is a video and discussion education program. The program focuses on instructing mothers about interaction with their infants, including affectionate handling and increasing the level of maternal involvement and sensitive responsiveness. The efficacy of this video and discussion education program was examined in a comparison study of two different interventions.

During this study, thirty-six mothers were chosen to participate approximately two to three days following delivery. Mother-infant pairs were assigned to either an enhancement group receiving the program or a control group, which received instruction on basic caregiving techniques (Wendland-Carro, Piccini, & Millar, 1999).

The enhancement group included both mother and infant, who watched a video about competence in caring for newborns, affectionate handling, and infant interactions. A discussion followed the video presentation to reinforce the video's content. Mothers later received written material and were encouraged to review this information at home to help them recognize their infant's behaviors during interactions. Mothers in the control group watched a different video about basic caregiving skills and infant health issues, followed by discussion. The video specifically did not make any reference to participation in social interactions, principles of affectionate handling, or maternal sensitivity. Mothers in the control group received written material on the items discussed in the video for use at home (Wendland-Carro et al., 1999).

Data included three two-minute long periods of video footage selected for analysis during observation of mother-infant interaction situations, which "were examined for the frequency of synchronous and asynchronous co-occurrences using a coding system" (Wendland-Carro et al., 1999, p. 716). Results confirmed that "the enhancement intervention was effective in increasing the overall amount of synchronized mother-infant interaction compared to the asynchronous interactions" (Wendland-Carro et al., 1999, p. 717). The results suggest that a videotape and discussion education program can serve as a way to enhance their responsiveness during mother-infant interactions (Wendland-Carro et al., 1999).

Individualized Family-Based Intervention

To address the needs of mothers and their high-risk infants, a highly individualized and family-based intervention was developed with an emphasis on parent-infant interaction guidance (Meyer, Coll, Lester, Boukydis, McDonough, & Oh, 1994). In a study performed by Meyer et al. (1994), the efficacy of this individualized family-based intervention was examined. Researchers hypothesized that the intervention would help to increase maternal self-esteem, reduce depression, enhance mother-infant interactions, and improve family functioning (Meyer et al., 1994).

During this study, a sample of 34 preterm infants and their families were selected to participate. Families were randomly assigned to either the intervention or control group, with parents in both groups completing a series of self-report questionnaires at pre- and post-intervention (Meyer et al., 1994). The intervention group received the standard care normally made available in the Special Care Nursery and additional care provided by the individualized family-based intervention, which focused on the following domains: "infant behavior and characteristics, family organization and functioning, caregiving environment, and home discharge and community resources" (Meyer et al., 1994, p. 241). Participants in the control group received only the same standard care provided in the nursery (Meyer et al., 1994).

Overall, the results were in favor of the mothers receiving the individualized family-based intervention in comparison to mothers only receiving standard care for their preterm infants. The study concluded that an "individualized, family-based intervention appears to reduce maternal stress and depression and to enhance early mother-infant feeding interactions" (p. 241). The unique design of the intervention may contribute to its

success. This individualized family-based intervention maintains a problem-based approach by addressing problems as stated by the parents, rather than problems being determined by the professionals (Meyer et al., 1994).

Summary

As reflected in this review of literature, specific aspects of the model of co-occupation are integrated into the design and structure of the SMILE curriculum, including the three main components of shared physicality, shared emotionality, and shared intentionality. Caregiving challenges relating to engagement in co-occupations with an infant experiencing a disability may be present in a mother's daily routine. These challenges are emphasized in the SMILE curriculum as well as taking into consideration the caregiver's level of self-confidence in their abilities (Erickson, 2011; Pickens & Pizur-Barnekow, 2009). Previous discussion of attachment theories has demonstrated how theory-related concepts reflect various principles within the SMILE curriculum, including maternal sensitivity and responsivity and the fostering of an infant's attunement to a caregiver during attachment formation (Barnekow & Kraemer, 2005; Bretherton, 1992; Erickson 2011). Attachment-related principles in the SMILE curriculum work to enhance the quality of the mother-infant relationship (Erickson, 2011). The topic on infants with special healthcare needs describes the challenges that caregivers experience when raising an infant recently discharged from the NICU. These challenges play a strong role in the issues which are addressed by use of the SMILE curriculum (Bakewell-Sachs & Gennaro, 2004; Erickson, 2011).

As previously discussed, the impact of maternal mental health on the mother-infant relationship demonstrates great significance due to the consequences associated

with difficulty engaging in co-occupations. In particular, the impact of low socio-economic status in combination with severe life stressors are strongly associated with the prevalence of maternal mental health conditions (Belle, 1990; Klebanov et al., 1994). This association should be emphasized in regard to the setting for this pilot study of the SMILE curriculum in the Milwaukee area, where poverty rates continue to increase (Tolan & Herzog, 2011). Additionally, a mother's poor emotional health may disrupt the level of maternal responsiveness during co-occupational performance and the developmental outcomes of the infant (Pizur-Barnekow, 2010; Thompson & Fox, 2010).

Interventions used to improve the mother-infant relationship including infant communication education, a video and discussion education program, and an individualized family-based intervention were discussed (Leitch, 1999; Meyer et al., 1994; Wendland-Carro et al., 1999). These interventions demonstrate relevance to the overall intent of the SMILE curriculum, which is to improve maternal confidence and competence during co-occupational engagement. This relevance indicates the need for further research on interventions focusing on the treatment approaches for mothers of infants with special healthcare needs, including this proposed pilot study of the SMILE curriculum (Erickson, 2011).

III. METHODS

During the process of conducting this study, there were changes from the original proposal to the completion of the study. These changes include the number of participants recruited, the main assessment tool used, the procedures in which the SMILE curriculum was implemented, and the method for data interpretation. Because this study investigated the feasibility of using the SMILE curriculum in early intervention settings, the procedural changes were necessary in order for participants to be recruited. These changes are illustrated the following table (see Table 2), and the reasoning for why such amendments were necessary is explained.

Table 2

Amendments to Study Methods

Amendment	Original Methods	Revised Methods
Number of Participants	Intervention Group: 4-6 Waiting-list Control Group: 4-6	Intervention Group: 3 Waiting-list Control Group: 3
Main Assessment	Maternal Self-Report Inventory (MSI)	Perceived Maternal Parenting Self-Efficacy Tool (PMP S-E)
Intervention	Group Format	Individualized Format
Data Interpretation	Group comparisons of pre- and post-assessment data	Feasibility and preliminary outcomes in early intervention

Research Design

This pilot study used an exploratory design with assignment of participants to either an intervention or waiting-list control group. Participants were assigned to one of two groups, including the first group for the SMILE curriculum intervention and the second group defined as the waiting-list control group (WLC). Group assignment was determined at random by the consecutive order of the date for each participant's first

scheduled appointment. During the study, pre- and post-assessment data was collected from both groups. As an incentive, each participant received a $25 gift card after pre-assessment and a second $25 gift card after post-assessment.

Hypothesis

The original aim of this study was to evaluate the effectiveness of the SMILE curriculum for use in this population. Amendments made to this study regarding the number of participants recruited and the format used for administration of the curriculum resulted in modification of the hypotheses for this study. A comparison of the original and revised hypotheses is provided in the following table (see Table 3).

Table 3

Comparison of Original and Revised Hypotheses

Original Hypotheses	Mothers in the SMILE curriculum intervention group in comparison to mothers in the waiting-list control group will demonstrate a significant improvement in their perceptions of the mother-infant relationship and level of maternal self-esteem in relation to co-occupational engagement. Risk factors for maternal depression as measured by the CES-D* will not affect scores on the MSI in either the intervention or waiting-list control group.
Revised Hypotheses	The SMILE curriculum can be feasibly administered in an early intervention setting as an individualized program. The PMP S-E and CES-D are appropriate measures of efficacy or are not. Risk factors for maternal depression as measured by the CES-D will not affect scores on the PMP S-E in either the intervention or waiting-list control group.

*Note: Center for Epidemiological Studies Depression Scale (CES-D)

Participants and Recruitment

To gather a sample of mothers to participate in this study, it was originally proposed that all participants would be recruited from Penfield Children's Center, a birth-

to-three therapy program and early childhood care center located in the Milwaukee area. Flyers explaining the study would be submitted to Penfield Children's Center and distributed to mothers, who have infants enrolled in program services to promote interest in participation. Although the process of recruitment resulted in identification of interested participants, a very limited number of participants had sufficient flexibility in their schedules that would allow them to attend SMILE curriculum sessions. Therefore, the Milwaukee Center for Independence (MCFI), another birth-to-three agency in the Milwaukee area, was chosen as a second location for the continuation of recruitment. IRB approval was obtained before recruitment of participants, including a second IRB approval for amendments that were made during the process of this study.

The following inclusion criteria were used to determine the eligibility of participants: All mothers must fall within the age range of 18-45 years old, speak English as a primary language, and have an infant diagnosed with special healthcare needs between the chronological age of 1 month and 3 years old. Mothers who were deemed eligible were screened for post-partum depression (PPD) using the Center for Epidemiological Studies Depression Scale (CES-D). A participant may be of any race/ethnicity and does not need to be a first-time mother or screen positive on the CES-D to be eligible for participation. However, any mothers who were currently taking prescribed medication(s) used to treat a psychiatric condition were excluded from this study to ensure that no psychiatric medications would influences results on the CES-D. All infants of eligible mothers had to be newly enrolled in therapy services at a birth-to-three agency during the time of the study in order to participate. Infants had to have a medical history significant for NICU care.

To determine eligibility of participants, modifications were made to the method for gathering the necessary information related to the inclusion and exclusion requirements for this study. These modifications are illustrated in a table describing amendments to recruitment (see Table 4).

Because the form of initial contact with interested mothers was via telephone, a phone interview (see Appendix B) was conducted to begin collection of demographic data in addition to determining participant eligibility. During the first scheduled meeting with each participant, further demographic data were gathered using a demographic survey (see Appendix C), which was used to establish background information on each participant for later interpretation of results from scores on the CES-D and PMP S-E.

Table 4

Amendments to Recruitment Procedure and Determining Eligibility

Amendment	Original Methods	Revised Methods
Recruitment Procedure	▪ Recruitment from Penfield Children's Center	▪ Recruitment from Penfield Children's Center ▪ Recruitment from Milwaukee Center for Independence
Determining Eligibility	▪ Demographic Data Questionnaire o To gather background information prior to eligibility	▪ Phone Interview Script o To gather background information prior to eligibility ▪ Demographic Survey o To gather additional demographic data at first meeting

SMILE Curriculum Group Intervention

In the original design for the intervention, mothers participating in the SMILE curriculum would be assigned to small groups, which typically include 4-6 participants per group as indicated in the curriculum guidelines (Erickson, 2011). Each small group would be informed of the scheduled dates and times for the two sessions that are part of the curriculum program. These two sessions of the program last about 90 minutes each with approximately a one-week period in between sessions to allow participants to practice what has been learned after the first session and receive feedback during the second session (Erickson, 2011). During the intervention period, all participants must continue to have their infants enrolled in the birth-to-three therapy services they have currently been utilizing.

When the process of scheduling meetings with eligible participants began, a challenge was encountered for how to schedule meetings for the SMILE curriculum sessions. The program was originally going to be administered in a meeting room at Penfield Children's Center. However, after the dates and times had been established for curriculum sessions to be held in the reserved meeting room, it became apparent that not all of the participants would be able to arrive at the same time for participation in this group-format intervention. This was specifically related to the busy schedules and varying work hours of participants when comparing all individuals interested in participating. The realization that all of the interested mothers recruited for this study have significantly busy schedules resulted in the motivation for creating an individualized protocol for the SMILE curriculum (see Appendix A) that was adapted from the original group-format curriculum.

The SMILE curriculum was modified to become an individualized program where the facilitator met with the mother at her home to administer the program, using one-on-one discussions to illustrate each module during program delivery. Adapting the curriculum to transform it into an individualized program allowed it to be more convenient for individuals interested in participating and translates more effectively to the reality of mothers who live busy lives. For this particular study, it was not possible for this program to be delivered in a group format. If this program were to be used in an early intervention setting, this would most likely be the reality for many mothers interested in learning the SMILE curriculum.

Waiting-List Control Group Intervention

Participants who were assigned to the waiting-list control group (WLC) waited for approximately one week during the study's intervention period before having the opportunity to participate in the SMILE curriculum intervention. During the Waiting period, participants had access to maternal mental health community resources in the Milwaukee area provided in a brochure made available to them if they scored 16 or higher on the CES-D, indicating being at risk for PPD. All participants in the WLC group were required to continue utilization of birth-to-three therapy services for their infant at either Penfield Children's Center or MCFI during the intervention period of this study. After approximately one week, participants in the WLC had the opportunity to participate in the SMILE curriculum sessions. However, when taking into consideration the personal schedules of each participating mother, the decision was made to make participation in the SMILE curriculum optional to those mothers assigned to the WLC

group. Although their participation was not required, all participants in the WLC group were strongly encouraged to take the opportunity to learn the SMILE curriculum.

Measures and Instrumentation

At the time of pre-assessment, participants were screened using the Center for Epidemiological Studies Depression Scale to identify those who were at-risk for diagnosis of post-partum depression (PPD), since this is common a factor that may influence the quality of mother-infant interactions (Thompson & Fox, 2010). The CES-D has been used previously for screening women to determine if they may be at risk for PPD. The age range of the mother's child at the time of screening is used to determine which screening tool should be used. The CES-D should be administered when the child is more than one year old within 45 days of entry into a birth-to-three program, and re-assessment is useful every 6 months thereafter (Runquist & Pizur-Barnekow, 2009). Because recruitment of participating mothers occurred in a birth-to-three setting, the CES-D is the appropriate tool to use for screening of participants for this study. The CES-D assesses symptoms of depression using a 20-item scale with a total score of 16 or higher resulting in a positive screen for being at risk for PPD. Items of the CES-D were derived from other previously validated depression assessments, including the Beck Depression Inventory (BDI), the Zung Self-Rating Depression Scale, and the Minnesota Multiphasic Personality Inventory – Depression Scale. As an assessment tool, the CES-D has good test-retest reliability as well as good internal consistency (Clark, Tluczek, & Wenzel, 2003). If a participant scored 16 or higher on the CES-D, she received a maternal mental health brochure with community resources to seek assistance for potential symptoms of PPD if necessary.

The Perceived Maternal Parenting Self-Efficacy (PMP S-E) Tool was chosen as the main assessment tool used to measure each participant's level of maternal self-efficacy. After closely reviewing the items used in the MSI, the decision was made to choose an assessment tool which would be more relevant to the purpose of the SMILE curriculum. Many of the categories present in the MSI, including body image and health, and feelings concerning pregnancy, labor, and delivery were not necessary to measure for this particular study, as these topics do not directly relate to the goals of the SMILE curriculum. Shared activities are the focus of the curriculum, so the level of maternal self-efficacy and its relationship to participation in shared activities between mother and infant should be the main objective to measure.

The PMP S-E tool consists of item statements that are significantly more relevant to the caregiving, interaction, and responsivity principles found within the SMILE curriculum. The concept of maternal self-efficacy can be defined as "mothers' perceptions of their ability to parent," which holds significant influence on guiding the interactions between mothers and their infants (Barnes & Adamson-Macedo, 2007, p. 550). The PMP S-E tool assists in measuring how a mother perceives her own ability to care for her infant during parenting tasks and interactions. After initial development of this assessment tool, the PMP S-E tool became a 20-item assessment with four separate subscales that include care taking procedures, evoking behavior(s), reading behavior(s) or signaling, and situational beliefs. A Likert scale is used for rating each item with a score of 1 indicating "strongly disagree" and 4 indicating "strongly agree" in response to each item's statement. Scoring can range from 20-80 points, and a lower score on this scale indicates lower maternal self-efficacy. As a self-report assessment tool, the PMP S-E is a

"psychometrically robust, reliable and valid measure of parenting self-efficacy" with good internal consistency reliability, external/test-retest reliability, and divergent validity (Barnes & Adamson-Macedo, 2007, p. 550).

The statements for the 20 items on this assessment and the subscale categories fit more closely with the concepts found in the SMILE curriculum, including discussion of shared interactions related to caregiving tasks, understanding how to read and understand an infant's cues, and learning to expect challenges as well as successes as a caregiver when trying new shared activities. Therefore, the PMP S-E was considered to be a more appropriate tool for data collection.

Data Collection

For this study, pre-assessment data was collected using the demographic survey, CES-D, and PMP S-E tool for all participants before they received their intervention as determined by group assignment. Participants in the SMILE curriculum intervention group were re-assessed approximately one week later after completion of their second session of the program, using both the CES-D and PMP S-E for collection of post-assessment data. Participants in the WLC group were also re-assessed after approximately one week after pre-assessment but without receiving the SMILE curriculum prior to post-assessment. The option to complete the SMILE curriculum was made available to participants in this group after data collection if they decided they would like to participate in the program.

At post-assessment, a lower score on the CES-D in comparison to the participant's baseline measurement indicated an improvement in the level of depressive symptoms for this screening tool. If a participant scored higher on the PMP S-E in

comparison to their pre-assessment score, this indicated an improvement in the level of maternal self-efficacy on this assessment. An additional question was included at the end of the PMP S-E post-assessment PMP S-E which asked the participant if she had developed a plan for engaging in shared activities after participation in the SMILE curriculum. At post-assessment, questions on both the CES-D and PMP S-E were presented in a different order so that the items would be randomized. The use of parent feedback forms after participation was also used at post-assessment in order to gather data on the quality of this program for the purpose of understanding its strengths and weaknesses.

IV. RESULTS

Demographic Data

During this study, the collection of demographic data using the information gathered from both the phone interview and demographic survey at pre-assessment provide insightful information on each participant and her child. Demographic data collected on all participants assisted in analysis of the relationship between the characteristics of participants and the data collected using the CES-D, PMP S-E, and parent feedback form completed at the end of the SMILE curriculum. The demographic data collected during pre-assessment have been reported in the following table to summarize the demographic characteristics for all participants. Although recruitment of participants for this study resulted in a significantly small sample size, the demographic characteristics (see Table 5) represent a relatively diverse group of mothers in terms of reported age, number of children, race/ethnicity, education level, work setting, and required work hours, which may hold influence on the interpretation of results. Participants also reported their zip code for their area of residence in the city of Milwaukee, which offers information on socio-economic characteristics for each given area (see Table 6).

Table 5

Demographic Characteristics of Participants

Characteristic	Participant (n = 6)	
	Average	*Range*
Age (Years)	28.5	20-34
Number of Children	2.167	1-4
Race/Ethnicity		
Black	3	
White	1	
Hispanic/Latino	2	
Education Level		
HS Diploma	3	
Associate's Degree	1	
Bachelor's Degree	1	
Master's Degree	1	
Work Setting		
Retail	2	
Healthcare	2	
Unemployed	2	
Work Hours		
Full-Time	4	
N/A	2	

Table 6

Zip Codes for Area of Residence and Socio-economic Characteristics

Participant (n = 6)	Zip Code	Average Income	Unemployment Percentage
P1	53205	Median household income significantly below state average	Unemployed percentage significantly above state average
P2	53215	Median household income below state average	Unemployed percentage above state average
P3	53216	Median household income below state average	Unemployed percentage above state average
P4	53212	Median household income below state average	Unemployed percentage above state average
P5	53204	Median household income below state average	Unemployed percentage above state average
P6	53204	Median household income below state average	Unemployed percentage above state average

During the initial phone interview with each participant to determine eligibility, further demographic data were collected to describe specific characteristics for each participant's child enrolled in birth-to-three service. This information allows for a more in-depth understanding of each participant's unique circumstances as a mother to an infant with special healthcare needs, which may play a role in the learning experience of the SMILE curriculum. These data describing the characteristics of each child is reported in the following table, including the age in months, the total length of stay (LOS) in the NICU in days, therapy services the child is enrolled in (see Table 7), and a short description of each child's medical condition(s) (see Table 8). It should be noted that the initial stay right after birth for two of the children in the NICU (P2 and P6) was significantly short, with a report of approximately 4 days after birth and 2 days after

birth, respectively. In this table, the calculated LOS includes the initial LOS and an additional stay in the hospital after heart surgery, with a report of approximately 90 days and 44 days total, respectively.

Table 7

Characteristics for Children of Participants

Characteristic	**Participant's Child (n = 6)**	
	Average	*Range*
Age (Months)	17	11-24
Total LOS in NICU (Days)	68.5	44-90
Therapy Services		
Physical Therapy	5	
Occupational Therapy	4	
Speech Therapy	6	

Table 8

Medical Conditions for Children of Participants

Group 1 (n = 3)		**Group 2 (n = 3)**	
Participant	**Child's Medical Condition(s)**	**Participant**	**Child's Medical Condition(s)**
P2	Developmental Delays, Down Syndrome	P1	Developmental Delays, Speech/Muscle Impairments
P3	Developmental Delays	P4	Developmental Delays, Brain Damage
P5	Developmental Delays, Heart Defect	P6	Developmental Delays, Heart Condition

Pre- and Post-Assessment Data

Due to the significantly small sample size for this study and a wide variety of life circumstances which are unique to each participant's situation, descriptive statistics will be used to report each participant's pre- and post-assessment data individually in a case study format. A detailed journal was kept by the researcher with entries written after each visit with a participant. The descriptions in this journal allowed further insight into each participant's current life situation and details on how the SMILE curriculum was administered to each participant during home visits. To ensure confidentiality for results, each participant's data have been reported using a codename, referring to an assigned number for each participant (P1, P2…) and indication of group assignment (G1, G2), where group 1 refers to the SMILE curriculum intervention group and group 2 refers to the WLC group. To summarize the data collected from the CES-D and PMP S-E, pre- and post-assessment data tables are provided below.

Table 9

Pre- and Post-Assessment CES-D Scores

Group 1 (n = 3)			**Group 2 (n = 3)**		
Participant	**CES-D Score**		**Participant**	**CES-D Score**	
	Pre-	**Post-**		**Pre-**	**Post-**
P2	6	4	P1	17	—
P3	4	1	P4	11	5
P5	3	4	P6	16	9

Table 10

Pre- and Post-Assessment PMP S-E Total and Subscale Scores

Group 1 (n = 3)										
Participant	**PMP S-E Total Score**		**Caretaking Procedures**		**Evoking Behavior(s)**		**Reading Behavior(s) and Signaling**		**Situational Beliefs**	
	Pre-	**Post-**	**Pre-**	**Post-**	**Pre-**	**Post-**	**Pre-**	**Post-**	**Pre-**	**Post-**
P2	73	70	15	13	26	24	20	21	12	12
P3	75	76	14	14	27	27	22	23	12	12
P5	79	80	15	16	28	28	24	24	12	12
Group 2 (n = 3)										
Participant	**PMP S-E Total Score**		**Caretaking Procedures**		**Evoking Behavior(s)**		**Reading Behavior(s) and Signaling**		**Situational Beliefs**	
	Pre-	**Post-**	**Pre-**	**Post-**	**Pre-**	**Post-**	**Pre-**	**Post-**	**Pre-**	**Post-**
P1	75	—	15	—	25	—	23	—	12	—
P4	63	59	13	11	22	21	19	17	9	10
P6	72	79	15	16	22	28	23	23	12	12

P1G2

During pre-assessment, participant P1G2, who had been assigned to the WLC group, completed the survey and all questionnaires. The participant scored a 17 on the CES-D, indicating a positive score for being at risk for PPD and received the maternal mental health brochure with a list of community resources. However, she stated that she did not feel she had any significant issues with symptoms of depression, attributing some of her responses on the CES-D screening tool to her daily life stressors. The participant had a high score of 75 (out of 80) on the PMP S-E assessment, indicating high maternal self-efficacy.

Unfortunately, the participant was unavailable for her appointment she had scheduled for the following week, stating that she was not home at the time. She rescheduled for the following day but again, was not home during the time of her rescheduled appointment with the researcher. Voicemails were left for the participant but there was no call-back in response, so she was dropped from the study.

P2G1

At the time of pre-assessment, participant P2G1, assigned to the intervention group, completed the survey and both questionnaires before participating in the first session of the SMILE curriculum. The participant scored a 6 on the CES-D, indicating a significantly low score and a negative screen for being at risk for PPD. She also scored a 73 on the PMP S-E, indicating a high level of maternal self-efficacy.

After pre-assessment, the participant received the first session of the SMILE curriculum. The session was administered in a quiet environment of her household with her child asleep in another room, who was not present at all during the session. After the first session, the participant stated that she enjoyed the program but it might have been more relevant earlier in her child's life immediately after her stay in the NICU. The participant stated that she would try to find the time to complete the optional homework assignment as part of the curriculum.

The following week, the participant was able to complete the second session of the SMILE curriculum. Again, the program was administered in a quiet setting and the child was not present during this time, allowing for an easier one-on-one discussion between participant and curriculum facilitator, however, observing the child while discussing mother-infant shared activities was not possible. At the end of the session, the

participant completed the parent feedback form and the CES-D and PMP S-E questionnaires. At post-assessment, the participant scored a 4 on the CES-D in comparison to her score of 6 at pre-assessment, indicating that she is still not at risk for PPD. On the PMP S-E, the participant scored a 70 at post-assessment. This indicates a decrease in her score in comparison to the 73 she scored during pre-assessment.

P3G1

Assigned to the intervention group, the participant P3G1 completed the demographic survey and questionnaires at pre-assessment before participating in the first session of the SMILE curriculum. She scored significantly low on the CES-D with a score of 4, indicating a negative screen for PPD, and after this questionnaire, she stated that she manages the stress in her life well. The participant also scored high on the PMP S-E with a score of 75, indicating a high level of perceived maternal self-efficacy.

During the first session of the SMILE curriculum, the participant's child was present in the room, displaying playful and attention-seeking behavior for the majority of the session. This behavior caused frequent disruptions during participant and facilitator discussions, however, the presence of the child helped to create more topics of conversation related to the concepts and strategies of the curriculum. After the first session, the participant stated that the program seems like it would be highly useful for mothers with infants who have just been discharged from the NICU, but her current situation does not hold as much relevance to some of the program's content, since her child is much older and she has become more experienced as a caregiver over time.

The following week the participant completed the second session of the SMILE curriculum. During this session, the participant's child was present along with her older

daughter who was occasionally present in the same room. A time limitation due to a busy schedule did not allow the participant to complete the optional homework assignment; however, she stated that she does see the benefit of trying new activities with her child in the future. There was also a unique occurrence during this session when the participant's daughter expressed an interest in learning what her mother was learning from the program.

After the second session, the participant completed the parent feedback form on the curriculum followed by completion of the CES-D and PMP S-E. At post-assessment, the participant had a significantly low score on the CES-D of 1 in comparison to her score of 4 at pre-assessment, indicating a negative screen. However, this score was the score accepted after the participant had to make corrections to some of her responses on it. At this point her child appeared to be highly distracting, and she stated she had read many of the questions incorrectly at first. The participant's PMP S-E score is reported at 76 for post-assessment in comparison to the 75 she scored on this questionnaire at the time of the previous visit.

P4G2

During the first visit, participant P4G2, who had been assigned to the WLC group, completed the demographic survey and the questionnaires. The participant scored relatively high on the CES-D with a score of 11. However, this score did not reach the cut-off score of 16 to indicate a positive screen for being at risk for PPD. The participant described specific circumstances over the past week which she felt may have influenced this relatively high score. At pre-assessment, the participant had a score of 63 on the PMP S-E, which indicates a relatively high level of maternal self-efficacy. After pre-

assessment, the participant stated that she was eager to learn the SMILE curriculum during the following week and was interested to see if it could benefit her.

At the next meeting with the participant, the CES-D and PMP S-E questionnaires were completed by her for the second time. There was an observable decrease in the participant's score on the CES-D, which resulted in a score of 5 at post-assessment in comparison to her score of 11 at pre-assessment. There was also an observable decrease in the participant's score on the PMP S-E which was at 59 during post-assessment in comparison to her score of 63 from the previous week.

After post-assessment, the participant chose to complete the SMILE curriculum. During administration of the curriculum, the participant was observed taking notes and chose to keep educational handouts about the curriculum that had been offered to her. At this time, the participant's child was resting and was not directly present in the room during the session, which created a quieter environment to help increase the focus during one-on-one discussions. The facilitator encouraged the participant to offer examples of shared activities that she performed with her child on a daily basis that were relatable to each topic of the curriculum. After her completion of the SMILE curriculum, the participant completed the parent feedback form and stated that she found the program useful in her situation.

P5G1

During her first visit, the participant P5G1, who was assigned to the intervention group, completed the demographic survey and questionnaires. At pre-assessment, the participant scored a 3 on the CES-D, indicating a negative screen for being at risk for

PPD. At pre-assessment, the participant scored a 79 on the PMP S-E, indicating a significantly high level of maternal self-efficacy.

After pre-assessment, the participant completed the first session of the SMILE curriculum. Although her child was present in the room for most of the first session, the distractions resulting from the child being in close proximity were minimal. Once again, the facilitator encouraged the participant to contribute real life examples of shared activities that she performed with her child during daily life.

During the next visit, the participant completed the second session of the curriculum. She stated that she was able to try the optional assignment of performing a shared activity with her child, which offered an opportunity to discuss how things went. The participant's child was present during the second session of the curriculum, so this also offered an opportunity to discuss her observed behaviors. After the second session, the participant completed the parent feedback form in addition to stating verbally that she felt the program seemed more relevant to her past experiences immediately after her child was discharged from the NICU. After administration of the CES-D for the second time, the participant scored a 4 which was only 1 point higher than her previous score, indicating a negative screen for being at risk for PPD. On the PMP S-E, the participant scored an 80, which is the highest possible score for this assessment and thus the highest level of perceived maternal self-efficacy.

P6G2

During the first meeting, the participant P6G2, assigned to the WLC group, completed the demographic survey and questionnaires. At pre-assessment, the participant scored a 16 on the CES-D, meeting the cut-off score for a positive screen for

being at risk for PPD. In response, the participant stated that she was feeling more stressed because her child had just received a recent surgery and a visit to a specialist resulted in her learning some further information about her son's condition that was causing her to worry. The participant's score required her to receive the maternal mental health brochure about PPD. The participant accepted the brochure as being potentially helpful if she did end up seeking any community resources in the future; however, she stated that she typically doesn't feel this way except over this past week. On the PMP S-E, the participant scored a 72, indicating a relatively high level of maternal self-efficacy. After completion of pre-assessment, the participant stated that she would like to take the opportunity to participate in the SMILE curriculum the following week, even after learning that the program was optional to her assigned group.

At the beginning of the next visit, the participant completed the questionnaires for the second time, scoring a 9 on the CES-D, indicating a negative screen for being at risk for PPD. On the PMP S-E, the participant scored a 79, indicating a slight increase from her score at pre-assessment of 72. After completing post-assessment, the participant made the decision to participate in the SMILE curriculum. Her child was present in the room at the time, but there were very few interruptions from the child that occurred during administration of the program. The participant's three older children were also present in the room, which did result in numerous interruptions, which although brief, were relatively distracting during delivery of the program content and discussions between the facilitator and participant. After completion of the SMILE curriculum, the participant completed the parent feedback form.

Parental Feedback on the SMILE Curriculum

After reviewing all of the data collected from this study, the most informative data to help understand the quality of the SMILE curriculum as an educational program may be from the parent feedback forms, which were completed by participants at the end of the program. Although the SMILE curriculum was made optional to participants in the WLC group, they were strongly encouraged to participate. Both participants in the WLC group chose to take the opportunity to participate in the curriculum, which allowed a greater amount of feedback on the program to be collected. The data from these parent feedback forms offers insight into how participants responded to the content that was presented to them and whether or not they felt this content was relevant and meaningful to them as mothers raising children with special healthcare needs. Data from the parent feedback forms is presented in a series of tables (see Appendix F) below to illustrate the comments made by participants about the quality of the SMILE curriculum. Each table displays responses from participants to a question from the parent feedback form. Unfortunately, data from participant P1G2 cannot be reported due to her dropping out of the study.

V. DISCUSSION

Study Aims

Due to revisions made to the methods for this study, the overall aim of the study changed. Modifications to the number of participants recruited and the way the SMILE curriculum was administered impacted how results were presented and how they were interpreted. Originally, the aim of this study was to evaluate the effectiveness of the SMILE curriculum. Group comparisons of pre- and post-assessment data using the PMP S-E and CES-D assessment tools would allow interpretation of the curriculum's level of effectiveness. However, due to the challenge of recruiting a large sample of participants, the methods for data interpretation were modified to examine the feasibility and preliminary outcomes of the SMILE curriculum for use in an early intervention setting. Although group comparisons of pre- and post-assessment data were not possible, data collected on the demographic characteristics of participants allowed for interpretation of individual scores on the CES-D and PMP S-E. These data interpretation offers insight into whether or not CES-D scores may correspond to PMP S-E scores. Use of parent feedback on the curriculum along with detailed accounts of what occurred during program delivery provided useful data to understand the curriculum's feasibility for use in an early intervention setting.

Interpretation of CES-D Scores

When interpreting the CES-D scores of participants for this study, it is important to recognize the potential influence of various socio-economic and life factors that are unique to each participants situation. After reviewing the data from journal entries written after visits with participants, various factors were identified which may have

influenced CES-D scores. These common factors include the presence of family support, the participant's level of education, the child's current health status, and the area of residence for each participant. Although these were common factors identified after collecting data on all participants, it should be noted that each participant's life situation is different and that the identification and potential contribution of socio-economic and life factors to scores on the CES-D is highly complex in nature.

Family Support

The presence of family support appeared to be a significant factor which may have influenced CES-D scores for certain participants. At the time of pre-assessment, the participant P1G2 scored a 17 on the CES-D, indicating a positive screen for being at risk for PPD. Although she responded by stating she was not experiencing any depressive symptoms, she did bring up the fact that she was a single mother in her response. She emphasized the importance of raising her children as a single mother with a high degree of independence, indicating limited family support. Having a more limited and less satisfying social support system is factor which may increase the risk for post-partum depressive symptoms by contributing an added form of stress in the mother's life (Thompson & Fox, 2010). Additionally, the factor of being unmarried may contribute to the risk for PPD (Goyal et al., 2010). In contrast, the participants, P2G1, P3G1, and P5G1 all scored very low on the CES-D with the scores of 6, 4, and 3 respectively. All three of these participants were married and lived in a supportive family household, which may suggest that the demographic factor of family support plays a role in decreasing the risk for post-partum depressive symptoms. This factor may be partially responsible for the low CES-D scores for these three participants.

Level of Education

The level of education for each participant is another socio-economic factor which may have influence on the scores for the CES-D. Participants P1G2, P4G2, and P6G2 all scored high on the CES-D at pre-assessment with scores of 17, 11, and 16, respectively. Participant P1G2 stated that she had an associate's degree, while participants P4G2 and P6G2 stated their highest level of education was earning a high school diploma. Having a relatively lower level education might be a potential factor contributing to these higher CES-D scores. Previous research on various socio-economic factors in relation to being at risk for post-partum depressive symptoms has identified low education as a variable related to an increase in depressive symptoms (Goyal et al., 2010). For this study, participants who had earned higher level degrees, including P2G1 with a master's degree and P3G1 with a bachelor's degree, had significantly lower CES-D scores at both pre- and post-assessment in comparison to those with a lower education level. However, there was one exception to this pattern. The participant P5G1 reported earning a high school diploma but had low scores on the CES-D with a 3 at pre-assessment and 4 at post-assessment. This exception indicates that as a socio-economic factor, a mother's level of education is not the only variable potentially influencing the risk for PPD symptoms.

Child's Current Health Status

At pre-assessment, participants who scored high on the CES-D, including participant P1G2 with a score of 17, P4G2 with a score of 11, and P6G2 with a score of 16 all reported their child's current health status as poor in response to learning their scores on the CES-D. In response, these participants tried to identify what was causing

stress in their lives over the past week and felt that being aware of the health status of their child was a main concern. For participant P1G2, she stated that she was currently enrolled in school but had to stay home recently due to her child's current medical issues. It is possible that she viewed this as a barrier to pursuing a higher level of education and felt stress from having serious concerns for her child's health. Participant P4G2 expressed experiencing a great deal of stress over the past week due to her child's recent surgery, which required her to spend four days in the hospital with her child during the recovery period. She stated that this might be why her score on the CES-D was relatively high. Participant P6G2 stated that she was feeling more stressed over the past week because her child had just recently underwent surgery. She also had an appointment with a pediatric specialist that resulted in her learning further information about her child's condition that was causing her to worry. As reported in the literature, the risk for developing post-partum depressive symptoms may increase if a mother experiences stress related to poor health status for her infant (Thompson & Fox, 2010).

At post-assessment, both participant P4G2 and P6G2 reported feeling less stressed in comparison to the previous week. Both participants stated that they felt less worried about their child's current health status after the surgery recovery period ended, which was reflected in a decrease in their scores on the CES-D. Unfortunately, post-assessment data could not be collected for participant P1G2, so it remains unknown whether or not her score decreased and if there were any changes in her child's current health status. In comparison to those who reported a poor health status for their child, the remaining three participants did not share any negative news about their child's current health status, which was reflected in their low scores on the CES-D.

Area of Residence

The area of residence may be a contributing factor to the high scores for participants P1G2, P4G2, and P6G2, as provided by the zip code information from the demographic survey. All three of these participants with high scores at pre-assessment lived in urban neighborhoods in the city of Milwaukee. For participant P1G2, city data on the zip code of 53205 indicates that the median household income is significantly below state average, while the unemployment percentage is significantly above the state average. This city data on median household income and unemployment percentage was similar for P4G2 (zip code 53212) and P6G2 (zip code 53204) but with slightly less significant rates in comparison to data provided on the area of residence for P1G2 (City-data.com, 2013). For low-income populations, research has indicated a higher prevalence of PPD, especially for mothers in urban neighborhoods (Goyal et al., 2010; Thompson & Fox, 2010). Overall, area of residence may be a contributing factor to the high CES-D scores for these three participants. It should be noted that average income and unemployment percentage data for the remaining participants have been reported to be at the same level. However, other more positive socio-economic factors for this group of participants may have a higher influence on their scores, including having a strong family support system, a higher level of education, and child without poor health status.

Interpretation of PMP S-E Scores

Although all participants scored relatively high on the PMP S-E at both pre- and post-assessment, some specific factors may offer further explanation for interpretation of these scores. A potential correspondence between CES-D scores and PMP S-E scores was noted, for which additional socio-economic factors may also play a role. In addition,

elements of bias, environmental factors and knowledge gained from the SMILE curriculum allow further interpretation of scores on the PMP S-E for specific participants.

Correspondence to CES-D Scores

In interpretation of PMP S-E scores, higher scores on the PMP S-E may correspond to higher scores on the CES-D, although not in all cases. A variety of other factors may further influence CES-D scores, including some of the previously mentioned socio-economic and life factors. However, the high scores of certain participants remain worthy of discussion. The participants P2G1, P3G1, and P5G1, who all scored significantly low on the CES-D at both pre- and post- assessment also scored very high on the PMP S-E. Therefore, it may be possible that lower levels of depressive symptoms are related to higher levels of maternal self-efficacy.

Although this score correspondence was observed for these three participants, there were some exceptions. Participants P1G2 and P6G2, who both scored high on the CES-D, still scored high on the PMP S-E. In the case of participant P1G2, she emphasized a high degree of independence as a single mother, which suggests the traits of strength and resilience in relation to her role as a caregiver. Thus, her level of perceived maternal self-efficacy appears to be positive even though she screened positive for being at risk for PPD. For participant P6G2, it is clear that she has significant experience being a mother, as she reported having 4 children during demographic data collection. Her years of experience as a mother most likely influenced her score on the PMP S-E, indicating a high level of maternal self-efficacy, even though she still scored high on the CES-D. Mothering experience may also be a common reason for the high PMP S-E scores for other participants because their children are no longer post-NICU

infants. Participants with previous mothering experience raising other children in their families in addition to raising their child with special healthcare needs for a length of time after NICU discharge may contribute to a mastery of maternal self-efficacy.

Elements of Bias

The presence of potential bias may contribute to elevated PMP S-E scores in participants at both pre- and post-assessment. Because participation in this study was voluntary, perhaps the mothers interested in participating may have already felt a high degree of maternal self-efficacy in their abilities raising a child with special healthcare needs. It is possible that the mothers participating in this study were already coping adequately with parenting challenges. The presence of high maternal self-efficacy before participation may have contributed to formulation of positive responses from participants on the PMP S-E assessment tool. An element of response bias may also be partially responsible for the high PMP S-E scores. Response bias may occur on assessments of self-efficacy, if the participants in this study felt the need to produce more socially desirable responses on their questionnaires in order to convey to the research that they already possess adequate mothering abilities.

Assessment Environment

For participant P4G2, there was an observable decrease in her score on the PMP S-E from pre- to post-assessment, which requires an explanation. The participant scored 59 on the PMP S-E at post-assessment in comparison to her score of 63 from the previous week. An explanation for this decrease is not as obvious. However, the participant's immediate environment appeared to be more chaotic in comparison to the first visit at her home. During the time of post-assessment, the participant's child was being fussy and

this caused frequent disruptions in her ability to focus with an increase in her level of frustration as she tried to complete the questionnaires. Her inability to calm her child down during this time further contributed to this frustration. In this case, it is possible that the environment during post-assessment may have influenced the participant's low score on the PMP S-E and that this assessment tool picked up on this specific environmental situation. Although it is difficult to say if this was the reason for the decrease in her score in comparison to pre-assessment, it is one likely explanation. The environment during assessment is significant to producing accurate results on questionnaires, so it is important to be aware of environmental situations when administering assessment tools, especially in early intervention settings.

New Knowledge and Awareness

For participant P2G1, a small decrease in her score on the PMP S-E was observed when comparing pre- and post-assessment scores. At pre-assessment, the participant scored a 73, which decreased to a score of 70 at post-assessment. Because the participant was assigned to the SMILE curriculum intervention group, it appears unusual for there to be a decrease in her score on the PMP S-E, which represents her level of maternal self-efficacy. However, it is important to consider the significant amount of new information delivered to the participant during administration of the SMILE curriculum. At post-assessment, the participant's acquirement of new knowledge and awareness about shared activities from the SMILE curriculum may have likely influenced her score on the PMP S-E. Being aware of new concepts and strategies may have changed the participant's perspective of her abilities as a caregiver to her child, thus slightly reducing her level of maternal self-efficacy.

Interpretation of Program Delivery

In addition to providing helpful information for interpretation of assessment scored, the detailed journal entries kept by the researcher offer further insight into how the SMILE curriculum was administered. After review of these entries, several characteristics relevant to program delivery were identified, which may provide useful information about the quality of the SMILE curriculum in relation to its content and how it is administered. These characteristics include the presence of the child during program delivery, the participant's contribution to discussions, the sharing of personal maternal experiences, and the potential to teach other family members the curriculum.

Presence of the Child

Because the SMILE curriculum was administered in the homes of participants, it was a common occurrence for the participant's child to be present in the room during delivery of the program. Although the curriculum's original format did not incorporate the child into sessions, it was discovered that there may be certain benefits to having the child present during the program, especially if used in an early intervention setting using an individualized program format. Most often, having the child present in the room allowed for a more enhanced learning experience and the sequence of program topics appeared to flow more naturally. The presence of the child offered more opportunities to discuss behaviors and interactions in order to form a connection with what was being taught throughout the program. Discussion of observed behaviors was particularly useful during discussion on state readiness, looking for cues, and upgrading or downgrading activities when necessary. Direct observation of the child's cues allowed for a productive discussion on learning how to read them. This may be a useful strategy for conveying

information presented in the curriculum because it utilizes real life examples that are occurring in the moment.

In contrast, when the child was not present in the room during program delivery, there was no opportunity to directly observe the behaviors and interactions of the child while learning about topics of the curriculum. Behavioral observation might have beneficial in these cases and could have potentially enhanced the delivery of the program. However, when the child is not present in the room, this allows for a much quieter environment for administration of the curriculum, resulting in fewer distractions. Even though having the child present in the room was overall quite beneficial to program delivery, it becomes more difficult to have a focused one-on-one discussion between participant and facilitator due to frequent interruptions from the child.

Contribution to Discussions

Another significant characteristic which helped increase the quality of program delivery was the encouragement given to participants to contribute knowledge from their personal experiences to discussions throughout the curriculum. The facilitator encouraged each participant to offer examples of shared activities that are performed with their child on a daily basis. This type of sharing from personal experiences and relating the descriptions of these shared activities to the concepts within the SMILE curriculum proved to be useful, increasing the productivity of discussions. Using this technique during facilitation of the curriculum also allowed conversations between facilitator and participant to flow more naturally and made each topic that was discussed more relevant to the participant's life. Building the content of the curriculum around a real shared activity creates an easier method for the participant to fully understand the concepts

within the curriculum. Additionally, the learning experience becomes more personal and meaningful to the participant because discussion about the shared activity is unique to the child and the participant's specific situation.

Sharing Maternal Experiences

Sharing of maternal experiences became a common characteristic observed during SMILE curriculum sessions. After realizing how open the participants were to discussing their past experiences in the NICU, this became a useful strategy to encourage conversation at the beginning of the program. Most specifically, participants frequently offered information about their past maternal experiences after completing the CES-D, reflecting on some of the more stressful times in their lives during the time when their infants were in the NICU. During the curriculum, asking a participant about her child's history immediately post-NICU contributed another way to examine her experiences with earlier shared activities. Using this strategy allows the participant to form a comparison between what shared activities were like with her infant in the past and what shared activities with her child are like now in the present. The sharing of these maternal experiences with shared activities also offers insight into how to modify the SMILE curriculum so that the content is made more relevant to mothers of children in an early intervention setting.

Family Member Education

During one experience of program delivery with the participant P3G1, there was a unique occurrence, which provides insight into expanding the target population for the SMILE curriculum. At the time of this particular curriculum session, the participant's older daughter was present in the room. She expressed an interest in learning what her

mother was learning from the program discussions she was observing. This situation indicates that perhaps the SMILE curriculum could be a useful program to teach to older siblings and other family members, who have a strong presence in the life of the child. The idea of educating family members using the SMILE curriculum was also suggested by this participant both during program delivery and on her parental feedback form.

Parental Feedback on the SMILE Curriculum

Responses on the parent feedback forms also offer descriptions of which parts of the content they were pleased with (see Appendix F). When participants were asked to define what a shared activity is, their responses indicated a basic understanding of this concept. Participants P1G2 and P6G2 offered more general responses, while the remainder of participants offered responses that were more personal examples of shared activities they perform with their children. For example, the participant P5G1 described an activity she plays with her child: a shared activity "would be playing with blocks helping [to show] her how things should go then see if she's able to work on it by herself." Participants were later asked why it is important to try new experiences with their babies and the responses indicated an understanding of this concept. Participant P2G1 stated that it is important "to help the baby learn – to expose [the] child to new learning activities and allow [the] child time to respond," which suggests an understanding of how learning and response play a role in shared activities. Other comments described bonding, creating learning experiences, working together, and finding ways to overcome challenges. From these responses, it appears that all participants were able to grasp these key concepts from the program. However, when asked to recall the steps in the SMILE model, the majority of participants were unable to

respond to this question fully. Because this is a question which involves recall memory, this may be why it was challenging to answer and perhaps providing a handout for participants in the future could be helpful for remembering the SMILE modules.

The responses from these feedback forms provide insight into the impact the program had on the behaviors of participants. When asked how likely they were to try new activities with their baby, four out of five participants said they were more likely to, which suggests that the program created motivation for them to try new things in the future. Although participant P2G1 responded by saying there is no difference in how likely she would try new activities, she also spoke about how she was already trying new things with her child even before participating in this program, which may be why her level of motivation was no different. Participants were later asked if they tried a new activity at home after the first session, for which two participants responded with "yes" and one responded that she might have but didn't remember. Participants in the WLC group said they would like to try a new activity in the future with participant P4G2 stating that "after this session I am highly encouraged to implement new ideas ☺." Although participants stated that they were open to trying new activities, two reported that they had not yet developed a plan nor followed through with using strategies from the program and one reported that she did develop a plan but did not change her behavior during interactions with her baby. These responses indicate that new strategies were not incorporated into shared activities. However, because participants had just recently learned the program, they may have not had time to follow through with suggestions yet.

Feedback on this program may prove beneficial for envisioning ways to improve the current content of the curriculum for future studies and possible implementation of

this program in a clinical setting. Response also provided useful information for determining whether or not the SMILE curriculum is feasible for use in an early intervention setting. When asked which information was most helpful from the curriculum, participants gave various responses. Two participants (P2G1 and P4G2) reported that the thinking process for planning new activities was helpful because it gave them additional ideas and strategies to use. Two participants (P4G2 and P5G1) felt that learning about cues and how to elicit more positive responses from their children was useful. One participant (P3G1) enjoyed discussion of the reason for trying new activities, while another (P6G2) reported the importance of not having such overwhelming expectations of her child. Although the comments were somewhat diverse, they all relate to the most critical parts of the content within the curriculum.

In response to the question of what was least helpful or what could be improved in the curriculum, two participants (P2G1 and P3G1) reported "none," indicating that they were overall satisfied with the program. Participant P4G2 elaborated on how she was familiar with most of the information in the curriculum before but that the curriculum "was like a relevant parenting class for parents with kids who have special needs." Participant P5G1 offered a suggestion to modify the program for use with older children, while P6G2 felt that even more information could be helpful. Other comments included an interest in trying a group format of the program to gather additional ideas from other parents and in educating other family members using the program. Overall, the participants appeared to be satisfied with the program but offered helpful suggestions for improvement, including making it more relevant for older children, using a group format, and using the program with family members.

Limitations for this Study

Several limitations are present for this study. Due to the initial challenges with recruitment, this study resulted in a small sample size (n=6), which did not allow for in-depth statistical analysis of the data collected. However, having a small sample did allow for report on the quality of the program, details on how it was administered during each session, and which specific characteristics of participants may have influenced results through illustration of data in a case study format. Although the sample size was small, this information provides insight into the feasibility of the program.

Referral or volunteer may be present due to the use of voluntary participation during process of recruitment. The level of motivation for mothers interested in learning this program could have potentially influenced results, as would other demographic factors, such as being a first-time mother or participating in any other types of educational interventions during the course of the study. However, the demographic data collected at pre-assessment which may reflect influential factors on outcome measures for this study may help in the interpretation of the data and inform results. Forming a potential threat to external validity, the early intervention setting used in this study also lacks consistency when performing the intervention in the home. There was diversity in the environmental factors for each participant's home during administration of all assessments and the intervention program. This maintains the potential limitation for this study of the results not being generalizable.

Significance and Implications for Future Research

This pilot study examined the feasibility and preliminary outcomes of the SMILE curriculum for use in an early intervention setting. Although the level of effectiveness

for the SMILE curriculum was unable to be determined, this was the first study to examine use of the curriculum with the mothers of infants enrolled in birth-to-three therapy services. There are limited programs in existence for early intervention settings, which seek to educate mothers on how to improve shared interactions with their infants. Therefore, understanding the feasibility of the SMILE curriculum is significant in demonstrating its usefulness as a new intervention that had not been previously researched.

Because this pilot study offers preliminary outcomes, future research on the SMILE curriculum should be performed using improved methods. The curriculum should be studied in both early intervention and NICU settings to determine the feasibility for program delivery in both clinical environments. This might additionally provide a comparison of how relevant the content of the curriculum is to mothers in both settings. Caregivers may receive the most benefit from the curriculum if it is provided within 1-2 months post discharge from the NICU. Results from a comparison study could help to identify ways to make the curriculum content more relevant to mothers of older infants enrolled in birth-to-three services in comparison to the NICU population. Performing studies to evaluate the effectiveness of the original protocol using a group format would also provide useful data. Future studies of the group format program in NICU settings would be especially insightful, as this was the population the program was originally designed for.

The knowledge gained from conducting this pilot study is beneficial for development of future studies. From the information gathered during the course of this study, researchers will know more about what to expect when conducting new studies on

the curriculum. The procedure for recruitment during this study may inform researchers to develop improved strategies for recruitment of participants on a larger-scale. Use of the PMP S-E in this study indicates a change in the assessment tool used is necessary, as this assessment appears to be more relevant to younger infants in a NICU setting. For future studies of the curriculum in an early intervention setting, it would be beneficial to find an assessment tool that is more relevant to mothers of infants enrolled in birth-to-three services. Additionally, this pilot study provides knowledge on program delivery strategies that appear to be effective when working with participants which informs researchers on how to best deliver the program in an individualized format for future studies. Further knowledge from parent feedback during this study also contributes useful information to help modify the program to increase its relevance for use in an early intervention setting.

VI. CONCLUSION

This pilot study provided new information on the feasibility and preliminary outcomes for the SMILE curriculum. Results indicate that the SMILE curriculum is feasible for use in an early intervention setting. The findings support the need for effective educational programs that enhance the mother-infant relationship. Other educational programs for mothers of infants with special healthcare needs which serve this purpose are limited, especially for use with the early intervention population. Therefore, use of the SMILE curriculum by occupational therapists in an early intervention setting appears to be promising.

As demonstrated during this study, the SMILE curriculum has significant potential to teach mothers how to improve interactions with their infants and implement new shared activities into their daily routines. Programs, such as the SMILE curriculum, may increase maternal self-efficacy during engagement in co-occupations, especially if the infant has a special need. Further research on the SMILE Curriculum in a larger and well-controlled replication study is indicated for assessment in both NICU and early intervention settings.

VII. REFERENCES

Ainsworth, M.D.S. (1979). Infant-mother attachment. *American Psychologist, 34(10),* 932-937.

American Psychiatric Association. (2000). Diagnostic and statistical manual of mental disorders (4th ed., text rev.). Washington, DC: Author.

Bakewell-Sachs, S. & Gennaro, S. (2004). Parenting the post-nicu premature infant. *The American Journal of Maternal Child Nursing, 29,* 398-403.

Barnekow, K.A. & Kraemer, G.W. (2005). The psychobiological theory of attachment: A viable frame of reference for early intervention providers. *Physical & Occupational Therapy in Pediatrics, 25,* 3-14.

Barnes, C.R. & Adamson-Macedo, E.N. (2007). Perceived maternal parenting self-efficacy (PMP S-E) tool: Development and validation with mothers of hospitalized preterm neonates. *Journal of Advanced Nursing, 60(5),* 550-560.

Beeghly, M., Olson, K.L., Weinberg, M.K., Pierre, S.C., Downey, N., & Tronick, E.Z. (2003). Prevalence, stability, and socio-demographic correlates of depressive symptoms in black mothers during the first 18 months postpartum. *Maternal and Child Health Journal, 7,* 157-168.

Belle, D. (1990). Poverty and women's mental health. *American Psychologist, 45(3),* 385-389.

Bretherton, I. (1992). The origins of attachment theory: John Bowlby and Mary Ainsworth. *Developmental Psychology, 28,* 759-775.

City-data.com (June 2013). City-data.com. Retrieved from http://www.city-data.com/

Clark, R., Tluczek, A., & Wenzel, A. (2003). Psychotherapy for postpartum depression: A preliminary report. *American Journal of Orthopsychiatry, 73,* 441-454.

Coyl, DD., Roggman, L.A., & Newland, L.A. (2002). Stress, maternal depression, and negative mother-infant interactions in relation to infant attachment. *Infant Mental Health Journal, 23,* 145-163.

Erickson, S. (2011). *The smile curriculum: Embedding co-occupations in daily routines.* Retrieved from Dr. Kris Barnekow

Gibbs, D., Boshoff, K., & Lane, A. (2010). Understanding parenting occupations in neonatal intensive care: Application of the person-environment-occupational model. *British Journal of Occupational Therapy, 73,* 55-61.

Goyal, D., Gay, C., & Lee, K.A. (2010). How much does low socioeconomic status increase the risk of prenatal and postpartum depressive symptoms in first-time mothers? *Women's Health Issues, 20,* 96-104.

Horowitz, J.A., Bell, M., Trybulski, J., Munro, B.H., Moser, D., Hartz, S.A., McCordic, L., & Sokol, E.S. (2001). Promoting responsiveness between mothers with depressive symptoms and their infants. *Journal of Nursing Scholarship, 33,* 323-329.

Klebanov, P.K., Brooks-Gunn, J., & Duncan, G.J. (1994). Does neighborhood and family poverty affect mothers' parenting, mental health, and social support? *Journal of Marriage and Family, 56,* 441-455.

Law, M., Cooper, B., Strong, S., Stewart, D., Rigby, P., & Letts, L. (1996). The person-environment-occupation model: A transactive approach to occupational performance. *Canadian Journal of Occupational Therapy, 63,* 9-23.

Leitch, D.B. (1999). Mother-infant interaction: Achieving synchrony. *Nursing Research, 48,* 55-58.

Meager, I. & Milgrom, J. (1996). Group treatment for postpartum depression: A pilot study. *Australian and New Zealand Journal of Psychiatry, 30,* 852-860.

Meyer, E.C., Coll, C.T.G., Lester, B.M., Boukydis, C.F.Z., McDonough, S.M., & Oh, W. (1994). Family-based intervention improves maternal psychological well-being and feeding interaction of preterm infants. *American Academy of Pediatrics, 93,* 241-246.

O'Hara, M.W., Stuart, S., Gorman, L.L., & Wenzel, A. (2000). Efficacy of interpersonal psychotherapy for postpartum depression. *Archives of General Psychiatry, 57,* 1039-1045.

O'Higgins, M., Roberts, I., & Glover, V. (2008). Postnatal depression and mother and infant outcomes after infant massage. *Journal of Affective Disorders, 109,* 189-192.

Olson, J.A. (2004). Chapter 2: Mothering co-occupations in caring for infants and young children. In S. Esdaile & J. Olson (Eds.) *Mothering occupations: Challenge, agency and participation* (pp. 28-51). Philadelphia, PA: F.A. Davis Company.

Pickens, N.D. & Pizur-Barnekow, K. (2009). Co-occupation: Extending the dialogue. *The Journal of Occupational Science, 16,* 151-156.

Pizur-Barnekow, K. & Knutson, J. (2009). A comparison of the personality dimensions and behavior changes that occur during solitary and co-occupation. *Journal of Occupational Science, 16,* 157-162.

Pizur-Barnekow, K. (2010). Maternal health after the birth of a medically complex infant: Setting the context for evaluation of co-occupational performance. *American Journal of Occupational Therapy, 64,* 642-649.

Pierce, D. (2000). Maternal management of the home as an infant/toddler developmental space. *American Journal of Occupational Therapy, 54,* 290-299.

Pierce, D. (2003). *Occupation by design: Building therapeutic power.* Philadelphia, PA: F.A. Davis Company.

Pierce, D. (2009). Co-occupation: The challenges of defining concepts original to occupational science. *Journal of Occupational Science, 16,* 203-207.

Portney, L.G. & Watkins, M.P. (2009). *Foundations of clinical research: Applications to practice.* Upper Saddle River: NJ.

Price, P. & Stephenson, S.M. (2009). Learning to promote occupational development through co-occupation. *Journal of Occupational Science, 16,* 180-186.

Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. Applied Psychological Measurement, 1, 385–401.

Runquist, J. & Pizur-Barnekow, K. (November 2009). Community-based maternal mental health screening in an early intervention program. Poster presentation scheduled for the American Academy of Nursing 36th Annual Meeting and Conference. Role: Contributing Author. Location: Atlanta, GA.

Shea, E., & Tronick, E. Z. (1988). The maternal self-report inventory: A research and clinical instrument for assessing maternal self-esteem. In H. Fitzgerald, B. M. Lester and M. W. Yogman, Theory and Research in Behavioral Pediatrics. New York: Plenum Press, 4.

Sneath, N. (2009). Discharge teaching in the NICU: Are parents prepared? An integrative review of parents' perceptions. *Neonatal Network, 28,* 237-246.

Tolan, T. & Herzog, K. (2011, September 21). Poverty numbers spike in Milwaukee. *Milwaukee Journal Sentinel: JS Online.* Retrieved from: http://www.jsonline.com/news/milwaukee/Poverty-numbers-spike-in-Milwaukee.html

Taylor, R.B., Perkins, D., Shumaker, S.A., & Meeks, J. (1991). *Impacts of fear of crime on depression and anxiety: A longitudinal stress and coping perspective.* Unpublished manuscript.

Thompson, K.S. & Fox, J. E. (2010). Post-partum depression: a comprehensive approach to evaluation and treatment. *Mental Health in Family Medicine, 7,* 249-257.

Wandersman, A. & Nation, M. (1998). Urban neighborhoods and mental health: Psychological contributions to understanding toxicity, resilience, and interventions. *American Psychologist, 53,* 647-656.

Wendland-Carro, J., Piccinini, C.A., & Millar, W.S. (1999). The role of an early intervention on enhancing the quality of mother-infant interaction. *Child Development, 70,* 713-721.

Zemke, R., & Clarke, F. (Eds.). (1996). *Occupational science: The evolving discipline.* Philadelphia, PA: F.A. Davis.

VIII. APPENDICES

Appendix A: EI Individualized Protocol

SMILE Curriculum

Individual Protocol: Facilitator Guide

Day 1

"This program will talk about the importance of shared activities between caregiver and infant.

- **Shared activities can influence an infant's brain development, so we will learn how to promote these activities during your daily routine."**

[Discussion about shared activities, questions to prompt]

"Can you think of an activity that you do with your baby?

Or what type of activity comes to mind when you think about playing with your baby?"

(Examples: playing, sleeping, bathing, getting diaper changed, interacting with parents/siblings/others, etc.)

"So this activity that you are describing is one that you and your baby can do together.

- **It's important to note that there may often be a shared physical response, a shared emotional response, and a shared purpose or goal during the activity.**
- **These are all key parts that make up the activity you do together with your baby.**
- **Some of these responses might be harder to observe in some babies due to medical issues or developmental delays, so some babies' response might be delayed or look confusing."**

[Discussion about playing with baby, questions to prompt]

"What comes to mind when you think of your baby and 'play'?

Did your baby get to 'play' in the hospital?

What do you and your baby do together now?

What are your concerns about playing with your baby?"

- **"These are all important questions and concerns you might have, especially when trying to read the responses of your baby during shared activities.**
- **There is a model that has been developed called the SMILE model that we will use to continue our talk about using shared activities with your baby during your everyday routines…"**

Safety

Matching

Interactive

Look

Expect

- **"We will look at what each of these letters mean and how they relate to doing a shared activity with your baby."**

S MILE

Safety and other basic needs

"Meeting basic needs like safety, comfort, or hunger will help set the stage for a more satisfying and effective play activity. Think of this 'ahead of time' work as making it easier for you later on. It can be much more fun and relaxing for you and your baby if you get this basic stuff out of the way first."

Activity: Setting the stage for safe play

- **"What are needs we need to consider? Could you show me the different areas of your home where you interact and play with your baby?"**

[If the parent is open to this, walk around the home and brainstorm what needs you could meet prior to engaging in shared activities in each area of the home]

Share examples if needed…

- Clean diaper
- Feeding/burping
- Rest/sleep (it is harder to concentrate and lots of people get less coordinated when they're tired)
- General comfort, e.g. temperature (air and surface), freedom to move (i.e. romper is not restricting movement, etc.)
- Safety (position relative to floor, leads in place if applicable, tubes/lines positioned so as not to catch/pull on baby with movement, tube feeding stopped if doing lots of movement, brothers/sisters aware of precautions, condition-specific precautions, etc.)

"One of the biggest mistakes you can make with safety is underestimating your baby. For example, even if your baby is not rolling over yet, assume he/she can move and never leave him/her unattended on a surface where he/she could fall."

S**M**ILE

Matching activities to developmental levels

"When talking about shared activities with your baby, it's important to remember that in utero, babies develop right up

until they're born, so babies born early miss out on time to develop.

- **Developmental level takes into account that whether or not he/she was born early, your baby might be at a different stage than expected for his/her age."**

Why does this all matter?

"We want to make sure that we're not expecting too much out of our kids when they're just not ready.

- **When we talk about a developmental timeline for hitting those milestones, it may not be appropriate for infants who are born early or who spend a significant amount of time in intensive care.**
- **We also don't want to let our babies miss out on important developmental experiences just because we think they are small, or fragile, or 'it's too soon.'**
- **So learning how to observe your infant can help you figure out the best way to engage in a shared activity."**

Part I: State Readiness. [Discuss Newborn/State/Interaction chart with state readiness cards and/or discuss signs exhibited by baby]

"Let's go over some signs that a baby is or is not ready to engage in play and shared activities."

Part II: Developmental Readiness. [Provide Developmental Continuum handout or discuss where this parent's baby is developmentally]

"Look at this sheet and guess where your baby falls on the continuum. What behaviors did you see that made you choose that spot?"

Activity: Activity Planning

"Certain activities are more demanding than others. (e.g. Playing with a rattle vs. shape-sorting vs. peek-a-boo)

- **"Let's pick an activity and do a plan. What does it [activity] require?**

[Prompt this discussion with different factors to consider]

Actions (object manipulation, sitting up, etc.)
Thinking skills (attention, problem-solving, etc.)
Environment (safe space, etc.)
Entertainment factor (will it keep her attention)
How long does it take?

"You can use this Activity Planning form when you're thinking about activities to do with your baby.

[Show Activity Planning handout and describe]

- **If you're ever unsure about whether an activity is appropriate, ask your OT, PT, RN, or pediatrician if there are any precautions you need to be concerned about."**

S M I L E

InterACTIVE shared activities with parent and baby

Activity: InterACT with your baby!

The parent chooses an activity to do with their child! Try to use an activity that is already part of the routine when you're in the home.

Optional Homework Assignment: InterACT with your baby!

"I have a short assignment for you to try after this first session ends and we can talk about it next time.

- **Choose 1 activity you'd like to try with your baby during a routine outside of therapy.**
- **It can be something we've talked about today or something completely different.**
- **If you don't have an idea yet, you can also look at the *Activities to Try* handout."**

[Show Activities to Try handout and describe]

- **"Remember, if it doesn't work out, that's fine – we can problem solve next time.**
- **We will talk about how it was to try a new activity. Do pay attention to how he/she reacts and don't force an activity if your baby is giving you cues that s/he is upset or in pain."**

What if I'm too busy to play?

"Make it part of your daily routine. Think of things you have to do every day with your child. Next time you're changing a diaper, try a game of peek-a-boo. When your baby's getting a bath, make a game out of singing and pointing to body parts.

- **Remember that babies mostly do things that are shared activities with you. That means *you'll* be playing, too! Have fun!"**

Day 2

Review of Last Session

- S-M-I: Safety and other basic needs, Matching activities and developmental levels, be InterACTIVE
- Infant observation – what do we look for?
- Activity Analysis

Discussion: Sharing about "homework"

"Let's discuss the shared activity assignment if you decided to try one with your baby at some point last week.

- **What activity did you try?**
- **How did your baby respond? Trying new things isn't always easy.**
- **Did baby like it? It's okay if you're not sure – it can be hard to read some babies' cues, and some babies might not have been sure how to react since you were trying something new.**
- **When in doubt, go with your instinct. Even if he/she didn't like it, are you willing to try it again?"**

S M I **L** E

Look for cues from baby

"When thinking about the activity you tried, what were your major cues (movements, sounds, etc.) that your baby did or did not like the activity?

- **What told you he/she was/wasn't ready for it yet?**
- **Looking for cues is important so you know whether the activity is the 'just right challenge' for baby."**

Activity: Upgrades and downgrades

"If you try an activity and baby doesn't seem to like it or seems uninterested, it is possible to change the activity in some way to make it more interesting.

- **If it's so easy that it gets boring, we do an *upgrade*, which means taking one part of the activity and making it a little harder or adding something new.**
- **If an activity is too hard, I take one aspect and make it easier, which is called a *downgrade*."**

"If your activity isn't going as well as you'd hoped, let's talk about ways we can upgrade or downgrade.

- **How is your baby reacting to your activity? What is he/she doing? How does he/she look?**
- **Where there any parts of it she liked? Did he/she smile? Respond to you with happy noises?**
- **How could we upgrade/downgrade the activity? It doesn't have to be a big change."**

Discussion: If the parent desires, brainstorm some new activities and talk about ways to upgrade and downgrade. Pick an activity and do a quick activity analysis.

"We can talk about this shared activity to think about ways to upgrade or downgrade it.

- **What do *you* need to be able to do to participate in this activity?**
- **What does your *baby* need to be able to do to participate?**
- **What *things* do we need to do this activity?**
- **What are major signs you'll look for to know if this activity is a good match for him/her?"**

Activity: Write on activity planning page for upgrade/downgrade discussion.

If it's too easy or boring for him/her, I can…
If it's too hard/complicated for him/her, I can…

"Remember that looking for baby's cues is important so we know whether the activities we're choosing are appropriate.

- **If we always choose activities that are too hard or complicated, baby could get frustrated. Make sure that your baby has chances to be successful."**

S M I L **E**

Expect challenges as well as successes

"The last letter in the program is 'E' for 'expect challenges'! We want our babies to have opportunities for fun and play, but it might take some work on your part to get to the fun stuff.

- **Remember – you are not alone – ALL parents face challenges with their babies."**

Some challenges parents might face…

- Baby cries or gets upset
- Baby gets bored and won't pay attention
- Baby doesn't seem to respond to the activity at all – positively or negatively
- The environment is too loud/bright/stimulating
- Baby was able to do more before, but due to a medical issue now seems to be experiencing a setback in his ability to participate
- You don't feel like you have enough time to spend on these things

"Any of these challenges could happen, but don't take them as a sign to give up trying play activities.

- **Remember to use strategies such as upgrades and downgrades, or changing aspects of the environment, or changing something directly related to the baby.**
- **As you get into the habit of matching activities to your baby, it will become more natural and it won't seem like such a chore.**
- **In the meantime, your work is paying off as your baby learns to explore his/her environment through play and developing his/her brain at the same time."**

"Don't forget to acknowledge little successes! (Point out successful interactions/strategies observed during session)

- **What are you going to use from the SMILE model?"**

Appendix B: Phone Interview Script

Hello and thank you for your interest in participating in this study.

In order to determine if you will be eligible to participate in this study, I will need you to answer a few important questions to the best of your knowledge.

All personal information collected during this interview will be protected to maintain confidentiality.

If it is determined that you are not eligible to participate, any personal information collected during this interview will be destroyed.

1. What is your date of birth? _____

2. Do you have a child who has been diagnosed with special healthcare needs between the ages of one month and three years old? _____

3. After your child was born, how long did he/she stay in the hospital?
_____

4. Where does your child currently receive birth-to-three therapy services? Which therapy services is your child receiving?
_____
_____
_____
_____

5. Why was your child referred to the early intervention program?
_____
_____
_____
_____

6. Are you currently taking prescribed medication(s)? If yes, which conditions are they used for?
_____
_____
_____
_____

If mother meets eligibility criteria: Thank you for providing answers to these questions. From the answers you have given, it has been determined that you are eligible to participate in the study. If you are still interested, I would like to schedule a meeting with

you to gather further information and provide you with a written consent form to participate in the study.

If mother does not meet eligibility criteria: Thank you for providing answers to these questions. Unfortunately from the answers you have given, it has been determined that you will not be eligible to participate in this study. Thank you for offering your time and expressing interest in volunteering to participate.

Appendix C: Demographic Survey

Instructions: Please accurately answer the following questions on this questionnaire to the best of your knowledge. All personal information collected from this form will be protected to maintain confidentiality.

1. What is the zip code of your current residence? _____

2. How many children do you have? _____

3. Highest level of education (please circle one):

- High School Diploma
- GED
- Associate's
- Bachelor's
- Master's
- Doctoral

4. Which best describes your primary work setting and required work hours?

Please circle all settings that apply: Please circle one: ▪ Part-Time ▪ Full-Time

- Business
- Administrative
- Retail
- Food Service/Hospitality
- Child Care
- Education
- Healthcare
- Industrial
- Other _____

5. Is your ethnicity Hispanic/Latino (Spanish origin)?

▪ Yes ▪ No

6. Which of the following choices best describe your race(s) (select all that apply)?

- American Indian or Alaska Native
- Asian
- Black
- Native Hawaiian or Other Pacific Islander
- White

Appendix D: CES-D

CES-D: Pre-Assessment

Instructions: Below is a list of some of the ways you may have felt or behaved. Please indicate how often you've felt this way during the past week. Respond to all items.

Place a check mark (√) in the appropriate column. **During the past week…**	**Rarely or none of the time (less than 1 day)**	**Some or a little of the time (1-2 days)**	**Occasionally or a moderate amount of time (3-4 days)**	**All of the time (5-7 days)**
1. I was bothered by things that usually don't bother me.				
2. I did not feel like eating; my appetite was poor.				
3. I felt that I could not shake off the blues even with help from my family.				
4. I felt that I was just as good as other people.				
5. I had trouble keeping my mind on what I was doing.				
6. I felt depressed.				
7. I felt that everything I did was an effort.				
8. I felt hopeful about the future.				
9. I thought my life had been a failure.				
10. I felt fearful.				
11. My sleep was restless.				
12. I was happy.				
13. I talked less than usual.				
14. I felt lonely.				
15. People were unfriendly.				

16. I enjoyed life.				
17. I had crying spells.				
18. I felt sad.				
19. I felt that people disliked me.				
20. I could not “get going.”				

CES-D: Post-Assessment

Instructions: Below is a list of some of the ways you may have felt or behaved. Please indicate how often you've felt this way during the past week. Respond to all items.

Place a check mark (√) in the appropriate column. **During the past week…**	**Rarely or none of the time (less than 1 day)**	**Some or a little of the time (1-2 days)**	**Occasionally or a moderate amount of time (3-4 days)**	**All of the time (5-7 days)**
1. I felt hopeful about the future.				
2. I had trouble keeping my mind on what I was doing.				
3. I thought my life had been a failure.				
4. I was happy.				
5. I felt that I could not shake off the blues even with help from my family.				
6. I felt fearful.				
7. I felt that everything I did was an effort.				
8. I felt lonely.				
9. I had crying spells.				
10. My sleep was restless.				
11. I talked less than usual.				
12. I felt sad.				
13. I was bothered by things that usually don't bother me.				
14. I did not feel like eating; my appetite was poor.				
15. People were unfriendly.				
16. I felt depressed,				
17. I enjoyed life.				

18. I felt that I was just as good as other people.				
19. I felt that people disliked me.				
20. I could not "get going."				

Appendix D: PMP S-E

PMP S-E: Pre-Assessment

Instructions: Please read each statement and circle one of the following for each question: strongly disagree, disagree, agree, or strongly agree.

1. I believe that I can tell when my baby is tired and needs sleep.	Strongly Disagree	Disagree	Agree	Strongly Agree
2. I believe that I have control over my baby.	Strongly Disagree	Disagree	Agree	Strongly Agree
3. I can tell when my baby is sick.	Strongly Disagree	Disagree	Agree	Strongly Agree
4. I can read my baby's cues.	Strongly Disagree	Disagree	Agree	Strongly Agree
5. I can make my baby happy.	Strongly Disagree	Disagree	Agree	Strongly Agree
6. I believe that my baby responds well to me.	Strongly Disagree	Disagree	Agree	Strongly Agree
7. I believe that my baby and I have a good interaction with each other.	Strongly Disagree	Disagree	Agree	Strongly Agree
8. I can make my baby calm when he/ she has been crying.	Strongly Disagree	Disagree	Agree	Strongly Agree
9. I am good at soothing my baby when he/she becomes upset.	Strongly Disagree	Disagree	Agree	Strongly Agree
10. I am good at soothing my baby when he/she becomes fussy.	Strongly Disagree	Disagree	Agree	Strongly Agree
11. I am good at soothing my baby when he/she continually cries.	Strongly Disagree	Disagree	Agree	Strongly Agree
12. I am good at soothing my baby when he/she becomes more restless.	Strongly Disagree	Disagree	Agree	Strongly Agree
13. I am good at understanding what my baby wants.	Strongly Disagree	Disagree	Agree	Strongly Agree

14. I am good at getting my baby's attention.	Strongly Disagree	Disagree	Agree	Strongly Agree
15. I am good at knowing what activities my baby does not enjoy.	Strongly Disagree	Disagree	Agree	Strongly Agree
16. I am good at keeping my baby occupied.	Strongly Disagree	Disagree	Agree	Strongly Agree
17. I am good at feeding my baby.	Strongly Disagree	Disagree	Agree	Strongly Agree
18. I am good at changing my baby.	Strongly Disagree	Disagree	Agree	Strongly Agree
19. I am good at bathing my baby.	Strongly Disagree	Disagree	Agree	Strongly Agree
20. I can show affection to my baby.	Strongly Disagree	Disagree	Agree	Strongly Agree

PMP S-E: Post-Assessment

Instructions: Please read each statement and circle one of the following for each question: strongly disagree, disagree, agree, or strongly agree.

1. I can make my baby calm when he/she has been crying.	Strongly Disagree	Disagree	Agree	Strongly Agree
2. I can tell when my baby is sick.	Strongly Disagree	Disagree	Agree	Strongly Agree
3. I am good at soothing my baby when he/she becomes fussy.	Strongly Disagree	Disagree	Agree	Strongly Agree
4. I can read my baby's cues.	Strongly Disagree	Disagree	Agree	Strongly Agree
5. I am good at soothing my baby when he/she continually cries.	Strongly Disagree	Disagree	Agree	Strongly Agree
6. I believe that I can tell when my baby is tired and needs sleep.	Strongly Disagree	Disagree	Agree	Strongly Agree
7. I can make my baby happy.	Strongly Disagree	Disagree	Agree	Strongly Agree
8. I believe that I have control over my baby.	Strongly Disagree	Disagree	Agree	Strongly Agree
9. I am good at bathing my baby.	Strongly Disagree	Disagree	Agree	Strongly Agree
10. I am good at keeping my baby occupied.	Strongly Disagree	Disagree	Agree	Strongly Agree
11. I am good at knowing what activities my baby does not enjoy.	Strongly Disagree	Disagree	Agree	Strongly Agree
12. I am good at soothing my baby when he/she becomes upset.	Strongly Disagree	Disagree	Agree	Strongly Agree
13. I am good at getting my baby's attention.	Strongly Disagree	Disagree	Agree	Strongly Agree
14. I believe that my baby responds	Strongly Disagree	Disagree	Agree	Strongly Agree

well to me.

15. I am good at changing my baby.	Strongly Disagree	Disagree	Agree	Strongly Agree
16. I believe that my baby and I have a good interaction with each other.	Strongly Disagree	Disagree	Agree	Strongly Agree
17. I am good at understanding what my baby wants.	Strongly Disagree	Disagree	Agree	Strongly Agree
18. I can show affection to my baby.	Strongly Disagree	Disagree	Agree	Strongly Agree
19. I am good at feeding my baby.	Strongly Disagree	Disagree	Agree	Strongly Agree
20. I am good at soothing my baby when he/she becomes more restless.	Strongly Disagree	Disagree	Agree	Strongly Agree

Please circle your response to this statement below.

After attending the SMILE curriculum sessions, have you…

a.) developed a plan for engaging in shared activities but did not change your behavior when interacting with your baby

b.) developed a plan and actually changed your behavior when interacting with your baby

c.) developed a plan and partially changed your behavior when interacting with your baby

d.) not developed a plan nor followed through with any suggestions from the SMILE curriculum when interacting with your baby

Appendix F: Parent Feedback Responses

1. ***What is a shared activity?***

Participant (n=6)	Question: What is a shared activity?
P1	—
P2	"Shared activity is engagement with caregiver and baby."
P3	"My daughter and I take turns reading to [my child]."
P4	"Shared activity is my involvement with baby, physical, emotional, and intentions."
P5	"Would be playing with blocks helping [to show] her how things should go then see if she's able to work on it by herself."
P6	"An activity done together bonding."

2. ***Why is it important to try new experiences together with your baby?***

Participant (n=6)	Question: Why is it important to try new experiences together with your baby?
P1	—
P2	"To help the baby learn – to expose child to new learning activities and allow child time to respond."
P3	No response
P4	"So that there is a bond between us and mainly to help with his development."
P5	"It gives her the experience to learn more and to work together."
P6	"To see what challenges they have and try to find a way to overcome the challenge."

3. ***After attending these parent sessions, how likely am I to try new activities with my baby…***

Participant (n=6)	Question: After attending these parent sessions, how likely am I to try new activities with my baby…
P1	—
P2	"No difference"
P3	"More likely"
P4	"More likely"
P5	"More likely"
P6	"More likely"

4. ***I tried a new activity at home after the first session.***

Participant (n=6)	Question: I tried a new activity at home after the first session. Yes or No.
P1	—
P2	"Yes, working on baby sign more consistently and doing 'hand over hand.'"
P3	"I might have did, but I don't remember it."
P4	"I was very involved with baby prior to. After this session I am highly encouraged to implement new ideas ☺"
P5	"Yes, it helps my baby with challenges and know we can work together."
P6	"Yes"

5. ***Can you remember the steps in the SMILE model?***

Participant (n=6)	**Question: Can you remember the steps in the SMILE model? Please fill in those that you can recall.**
P1G2	—
P2G1	No response
P3G1	"Safety, Matching, Interactive, Looks, Expect"
P4G2	"Safety, Managing, I ?, Look, Expectations"
P5G1	"S ?, M ?, Interacting, Learning the Cues, E ?"
P6G2	"S ?, M ?, Interact, L ?, E ?"

6. ***What was most helpful to you here?***

Participant (n=6)	**Question: What was most helpful to you here? Make sure to think about both sessions.**
P1G2	—
P2G1	"Discussion about the activity was most helpful. Conversation allowed for further processing of activities and gave additional ideas."
P3G1	"Doing activity with your baby and the reason why you [should]"
P4G2	"The idea of thinking process and seeing how can I make his responses better to activities or shared time that he does not like."
P5G1	"What was most helpful was to take into consideration my baby's cues to either stop or continue and activity."
P6G2	"To know what my expectations of my child were not overwhelming to both parent or baby and that it's ok to try something new activity with baby."

7. ***What was least helpful? What could we do better?***

Participant (n=6)	**Question: What was least helpful? What could we do better?**
P1G2	—
P2G1	None
P3G1	None
P4G2	"None, everything was nice to know or hear even if I've already heard it before. It was like a relevant parenting class for parents with kids who have special needs."
P5G1	"Being able to modify the program for older kids."
P6G2	"All information was helpful maybe even more information would be great to educate myself."

8. ***Other comments/concerns***

Participant (n=6)	**Question: Other comments/concerns**
P1G2	—
P2G1	"Would be interested in a group session to have feedback and additional ideas from other parents, Worked well with leader due to her open-minded approach and positive feedback."
P3G1	"It would be good to get the feedback for the whole family, sisters and brothers."
P4G2	"Great work with study information!"
P5G1	None
P6G2	None

9. ***After attending SMILE curriculum sessions have you…***

Participant (n=6)	**Question: After attending SMILE curriculum sessions have you…**
P1G2	—
P2G1	"Not developed a plan nor followed through with any suggestions from the SMILE curriculum when interacting with your baby"
P3G1	"Not developed a plan nor followed through with any suggestions from the SMILE curriculum when interacting with your baby"
P4G2	N/A
P5G1	"Developed a plan for engaging in shared activities but did not change your behavior when interacting with your baby"
P6G2	N/A

Appendix G: Full Text Descriptions

Figure 1: Co-occupational Spectrum

Brief Description: Three overlapping circles, each with a smaller circle inside, representing the degree of each element present in a particular co-occupation

Essential Description: This figure visually illustrates how a co-occupation falls on a spectrum, ranging from essential to complex. In the figure, the intensity of each aspect, including shared physicality, shared emotionality, and shared intentionality, may be present to a different degree. The figure represents how each co-occupation is unique.

Detailed Description: The figure has three circles which overlap uniformly with each in the style of a venn diagram. The first circle is centered and located at the top of the diagram with the term of shared physicality located outside the circle and to the right. The second circle is located below and slightly to the left of the first circle with the term of shared emotionality located outside the circle and to the left. The third circle is located below and slightly to the right of the first circle with the term of shared intentionality outside the circle and to the right. Together, all three of these overlapping circles represent the aspects which form a co-occupation.

Within the first circle at the top of the diagram, there are four short dashed lines running down the middle of the inside of this circle. To the right of each dashed line, there is a number (1-4) to represent the degree or strength of each aspect of co-occupation. A smaller circle has been placed on the fourth dashed line in the center of the diagram to represent a high degree of shared physicality. Within the second circle, a series of three dashed lines are oriented diagonally from left to right to reach the center of the diagram. A smaller circle has been placed on the third dashed line within this second circle to represent a moderate degree of shared emotionality. Within the third circle, a series of three dashed lines are oriented diagonally right to left to reach the center of the diagram. A smaller circle has been placed on the second dashed line within this third circle to represent a minimal level of shared intentionality. Together, these small circles indicate how the level of each aspect may vary for any given co-occupation, ranging from the most basic or essential to the most complex.

Table 1: Main Principles of Attachment Theory

Brief Description: A table composed of two main parts created to describe the main concepts relating to attachment theories of Bowlby and Ainsworth as well as main concepts relating to the Psychobiological Attachment Theory (PAT).

Essential Description: This table offers a summary of the main principles relating to attachment, including theories developed from the work of John Bowlby and Mary Ainsworth and descriptions of the Psychobiological Theory of Attachment (PAT).

Detailed Description: The table is divided into two columns. Beginning from the left side of the table, the first column has a heading titled Attachment Theories of Bowlby and Ainsworth with six key terms listed in this column below the heading: Attachment, Evolutionary Purpose, Security Theory, Maternal Sensitivity, Secure Attachment, and Insecure Attachment. The second column has a heading titled Psychobiological Attachment Theory (PAT) with six key terms listed in this column below the heading: Maternal-Infant Bonding, Developmental Purpose, Psychobiological Regulation, Homeostatic Regulation, Socio-Cultural Factors, and Social-Emotional and Cognition.

Table 2: Amendments to Study Methods

Brief Description: A table composed of two main parts, which describes amendments made to the study

Essential Description: This table describes the amendments made to this pilot study by comparing the original methods to the revised methods that were necessary in order for the study to be completed.

Detailed Description: The table is divided into three columns. Beginning from the left side of this table, the first column has a heading titled Amendment, followed by four categories for the amendments made for this study: Number of Participants, Main Assessment, Intervention, and Data Interpretation. The second column has a heading titled Original Methods, followed by four descriptions which correspond to the amendment categories stated in the first column of this table. The third column has a heading titled Revised Methods, followed by four descriptions which correspond to the amendment categories stated in the first column of this table.

Table 3: Comparison of Original and Revised Hypotheses

Brief Description: A table composed of two main parts, which describes differences between the original proposed theses and revised theses.

Essential Description: This table illustrates a comparison of the original hypotheses to the revised hypotheses after amendments were made for this study.

Detailed Description: This table is organized into two rows. Each row is composed of two columns. For the top row, the first column beginning on the left side has a heading titled Original Hypotheses. The second column describes the original hypotheses. For the bottom row, the first column beginning on the left side has a heading titled Revised Hypotheses. The second column describes the revised hypotheses.

Table 4: Amendments to Recruitment Procedure and Determining Eligibility

Brief Description: A table composed of two main parts, which describes amendments made to the methods for this study

Essential Description: This table compares and describes the amendments made relating to the recruitment and eligibility procedure for participants in this study.

Detailed Description: This table is divided into three columns. Beginning from the left side, the first column has a heading titled Amendment, followed by two amendment categories: Recruitment Procedure and Determining Eligibility. The second column has a heading titled Original Methods, followed by two descriptions of the original methods used for this study which correspond to the amendment categories stated in the first column. The third column has a heading titled Revised Methods, followed by two descriptions of the revised methods used for this study which correspond to the amendment categories stated in the first column.

Table 5: Demographic Characteristics of Participants

Brief Description: A table with a list of demographic characteristics representative of this sample of participants

Essential Description: This table describes the demographic characteristics for all six participants in this study. Each demographic characteristic reported is defined by a categorical term to organize the table.

Detailed Description: The table is divided into two separate columns. Beginning from the left side of the table, there is a heading titled Characteristic, followed by five main categories with various subcategories organizing the types of demographic characteristics that are reported: Age, Number of Children, Race/Ethnicity, Educational Level, Work Setting, and Work Hours. The heading of the second column is titled Participant (n = 6), followed by the reported data which corresponds to each demographic characteristic.

Table 6: Zip Codes for Area of Residence and Socio-economic Characteristics

Brief Description: A table reporting participant zip codes with related socio-economic characteristics

Essential Description: This table states the zip code for each participant in this study with the socio-economic characteristics corresponding to each reported zip code.

Detailed Description: This table is divided into four columns. Beginning from the left side of the table, the first column has a heading titled Participant (n = 6), followed by a list of each participant for this study. The next three columns each have a designated heading with the following titles from left to right: Zip Code, Average Income, and Unemployment Percentage. The categories of Average Income and Unemployment Percentage display a list of socio-economic characteristics corresponding to each participant's zip code.

Table 7: Characteristics for Children of Participants

Brief Description: A table reporting characteristics for children of participants

Essential Description: This table describes specific characteristics of each participant's child for this study.

Detailed Description: The table is divided into two columns. Beginning from the left side of this table, the first column has a heading titled Characteristic with a series of categories of characteristics describing the children in this study: Age, Total LOS in NICU, and Therapy Services. The second column has a heading titled Participant's Child (n = 6), followed by descriptive data that corresponds to each category in the right column of the table.

Table 8: Medical Conditions for Children of Participants

Brief Description: A table listing medical conditions for children of participants in this study

Essential Description: This table describes the medical condition(s) for each participant's child with the table divided into group 1 (intervention group) and group 2 (WLC group).

Detailed Description: This table is divided into two main sections. Beginning on the left side of the table, the first section has a main heading titled Group 1 (n = 3) at the top of the table. The section is further divided into two columns to organize the information for participants in the intervention group. The first column has a heading titled Participant, followed by a list of participants. The second column has a heading titled Child's Medical Condition(s) with a list of medical condition(s) corresponding to the name of each participant listed in the first column of section one.
The second section of this table has a main heading titled Group 2 (n = 3) at the top of the table. The section is further divided into two columns to organize the information for participants in the WLC group. The first column has a heading titled Participant, followed by a list of participants. The second column has a heading titled Child's Medical Condition(s) with a list of medical condition(s) corresponding to the name of each participant listed in the first column of section two.

Table 9: Pre- and Post-Assessment CES-D Scores

Brief Description: A table reporting the pre- and post-assessment scores on the CES-D for participants

Essential Description: This table reports the pre- and post-assessment data collected from the CES-D, organized by group 1 (intervention group) and group 2 (WLC group).

Detailed Description: This table is divided into two main sections. Beginning on the left side of the table, the first section has a main heading titled Group 1 (n = 3) at the top of

the table. The section is further divided into two columns to organize the information for participants in the intervention group. The first column has a heading titled Participant, followed by a list of participants. The second column reports pre-assessment CES-D scores and third column reports post-assessment CES-D scores which correspond to each participant listed in the first column for this section.

The second section of this table has a main heading titled Group 2 (n = 3) at the top of the table. The section is further divided into two columns to organize the information for participants in the WLC group. The first column has a heading titled Participant, followed by a list of participants. The second column reports pre-assessment CES-D scores and third column reports post-assessment CES-D scores which correspond to each participant listed in the first column for this section.

Table 10: Pre- and Post-Assessment PMP S-E Total and Subscale Scores

Brief Description: A table reporting the pre- and post-assessment scores on the CES-D for participants

Essential Description: This table reports the pre- and post-assessment data collected from the PMP S-E, including total scores and subscale scores, organized by group 1 (intervention group) and group 2 (WLC group).

Detailed Description: The table is divided into two main sections with the first section above and the second section located below the first. The first section has a main heading titled Group 1 and is divided into six separate columns. Beginning from the left side of this section, the first column has a heading titled Participant, followed by a list of three participants in group. The second column has a heading titled PMP S-E Total Score and lists the pre- and post-assessment scores corresponding to the three participants listed in the first column. The headings of the third through sixth columns have the following heading titles, representing the PMP S-E subscale score categories, listed here in consecutive order: Caretaking Procedures, Evoking Behavior(s), Reading Behavior(s) and Signaling, and Situational Beliefs.

The second main section for this table has a main heading titled group 2 and is then divided into six columns with the same headings as stated for the first main section, listed in the same order. Beginning from the left side of this section, the first column has the heading titled Participant, followed by participants in group 2. PMP S-E total scores and subscale scores for pre- and post-assessment are listed in the next five columns, corresponding to the participants listed in the first column.