

A CONCEPTUAL FRAMEWORK FOR A MUSIC-BASED BONDING INTERVENTION
FOR FATHERS WITH PREMATURE INFANTS IN THE NICU

By

Copyright 2016

Kara Nicole Caine

Submitted to the graduate degree program in Music Education and Music Therapy and the Graduate Faculty of the University of Kansas in partial fulfillment of the requirements for the degree of Master of Music Education (Music Therapy).

Chairperson: Dr. Deanna Hanson-Abromeit

Dr. Cynthia Colwell

Dr. Abbey Dvorak

Date Defended: May 5, 2016

The Thesis Committee for Kara Nicole Caine
certifies that this is the approved version of the following thesis:

A CONCEPTUAL FRAMEWORK FOR A MUSIC-BASED BONDING INTERVENTION
FOR FATHERS WITH PREMATURE INFANTS IN THE NICU

Chairperson: Dr. Deanna Hanson-Abromeit

Date approved: May 12, 2016

Abstract

Premature birth has long-term effects on an infant's development. Admittance to the NICU is stressful for both the infant and the parents. In this environment, parents may have barriers to bonding with their infant, making it more difficult to form a secure infant-caregiver attachment. The quality of attachment between an infant-caregiver can be predictive of future psychopathology or can act as a protective factor. Research is emerging regarding the father's distinct role and experience of becoming a parent in the NICU, and no published music therapy literature has focused specifically on fathers and their bonding and attachment with their premature infants in the NICU. The purpose of this study is to understand the unique experience of fathers with a premature infant admitted to the NICU in order to generate a conceptual framework, grounded in theory, for how music therapy intervention can increase secure father-infant attachment relationships. An iterative review of literature, and ecological systems theory and causal modeling were used to identify the key constructs relevant to the father's unique experience in this setting. A theory-based conceptual framework for a music-based bonding intervention for fathers with premature infants in the NICU is illustrated. Implications for further research and clinical practice were also explored.

Acknowledgments

I'd like to express my gratitude to my committee members, Dr. Colwell and Dr. Dvorak, for your helpful edits, comments, and questions. Your unique perspectives helped shape my writing and thinking throughout this process. Thank you also for supporting me in doing something a little bit different for a thesis.

My thinking about music therapy as a discipline has dramatically changed throughout my two short years at KU. A large part of this shift is due to Dr. Hanson-Abromeit. I am grateful for your support and guidance as my committee chair and a clinical supervisor in the NICU. You have inspired me to think about changing the mold rather than always trying to fit in it. I'm excited to continue working with you as I begin my Ph.D. journey.

I'm especially grateful to my family who has always supported my passion for music therapy. I am also thankful to my past and current clients and families that have let me be witness to their vulnerability, hard work, successes and failures. You have left permanent imprints on my heart.

My deepest gratitude is to my husband, Danny. I truly could not have finished this project without your support and help. Your belief in me as a therapist, teacher and scholar has sustained me through the ups and downs of this degree. I'm so thankful for your willingness to join me as my partner-in-crime, wherever the next step takes us. I love you.

Table of Contents

Abstract.....	iii
Acknowledgments.....	iv
Table of Contents.....	v
List of Figures.....	ix
List of Tables.....	x
Chapter 1 Introduction.....	1
Music as an Evolutionary Tool.....	3
Development and Use of Theory in Music Therapy.....	4
Purpose of the Study.....	6
Chapter 2: Review of Literature.....	7
Transition to Fatherhood.....	7
Prenatal period.....	7
Prenatal period.....	7
Birth.....	10
Postnatal period.....	11
Attachment Theory and Fatherhood.....	13
The NICU: A Father’s Perspective.....	16
Patient- and Family-Centered Care in the NICU.....	20
Music Therapy in the NICU.....	22
Infant-directed singing: A music therapy intervention strategy.....	23
Problem Statement.....	29
Chapter 3: Theoretical Framework.....	30

Ecological Systems Theory	30
Mesosystem.....	32
Exosystem	33
Macrosystem	33
Chronosystem	33
Ecological transition	33
Developmental validity.....	34
Importance of dyads.....	34
Causal Modeling.....	35
Outcome variable	36
Mediators	37
Moderators	37
Moderated moderators, moderated mediators, and mediated moderators	37
Reciprocal relationships.....	38
Theoretical synthesis.....	38
Researcher’s Frame.....	39
Experiences, beliefs and motivations that have shaped this research.....	39
Researcher’s cultural background and group membership.....	40
Potential biases.....	41
Effects of research on the researcher	41
Chapter 4: Results.....	42
Identifying & Defining Constructs	43
The individual in ecological systems theory.....	44

Father	44
Constructs identified and defined in the microsystem	44
Premature Infant.....	45
Father-infant dyad.....	45
Fatherhood role	45
The medical staff.....	47
Mother.....	47
Distress.....	47
Coping strategies.....	47
Family demographics.....	48
Constructs identified and defined in the mesosystem.....	48
Quality of the co-parent relationship	48
Workplace demands.....	49
Staff relationship.....	49
Parental self-efficacy	49
Bonding.....	51
State of mind.....	51
Considerations for the exosystem and macrosystem	51
Constructs identified and defined in the chronosystem	52
Time spent in the NICU	52
Prenatal attachment.....	52
Using Causal Modeling To Explore Change	53
Outcome variable	53

Moderators	53
Mediators	53
Confidence in voice	54
Intervention	54
The Conceptual Framework for a Music-Based Bonding Intervention.....	55
Relationships in the conceptual framework	57
Chapter 5: Discussion	60
Strengths of the Conceptual Framework	60
Limitations	62
Future Research Directions.....	64
Implications for Practice.....	65
Conclusion	67
References.....	68

List of Figures

Figure 1: Bronfenbrenner's ecological systems theory (1979) with father at the center	31
Figure 2: Ecological systems for fathers in the NICU	43
Figure 3: Conceptual framework for a music-based bonding intervention for fathers with premature infants in the NICU	56

List of Tables

Table 1: References for the conceptual framework 57

Chapter 1

Introduction

According to the Centers for Disease Control and Prevention, premature birth affected one in ten infants born in the United States in 2014. Prematurity has long-term effects on an infant's development; the earlier a baby is born, the higher the risk for developing a disability or death (Centers for Disease Control and Prevention, 2015). A premature infant is required to finish the development and growth process outside of the womb, in an unnatural and often stressful environment. The Neonatal Intensive Care Unit (NICU) is also a stressful, even traumatic, environment for parents (Binder, Zeltzer, Simmons, Mirocha, & Pandya, 2011; Feeley, 2011; Shaw, Deblois, Ikuta, Ginzburg, Fleisher & Koopman, 2006). Within the NICU, parents may have many barriers to bonding with their infant, including limited physical contact, the stress of the infant's health concerns, unfamiliar medical equipment and negotiating their parental role with staff (Johnson, 2008). This likely disrupts the typical bonding experiences between caregivers and infants, making it more difficult to form a secure infant-caregiver attachment (Johnson, 2008).

Attachment is the bond between an infant and his or her primary caregivers (VandenBos, 2015, p. 86). Attachment is learned after birth and is foundational for social and emotional development (Zeanah & Smyke, 2009). Only in unusual and/or extreme environments does an infant not develop an attachment to caregivers, resulting in a clinical diagnosis (Zeanah & Smyke, 2009). Diagnoses for attachment disorders include Reactive Attachment Disorder (RAD) and Disinhibited Social Engagement Disorder (DSED) (American Psychiatric Association, 2013). Outside of a clinical diagnosis there are different classifications of attachment that can be considered risk and protective factors (Zeanah & Smyke, 2009). The

disorganized attachment pattern is considered a risk factor for future psychopathology (Zeanah & Smyke, 2009). The quality of attachment an infant develops is connected to the quality of caregiving (Schechter & Willheim, 2009).

Neonatal music therapy research emerged in the late 1980s and early 1990s with a focus on premature infants (Hanson-Abromeit, Shoemark & Loewy, 2008). With the rise of family-centered care, more music therapists are focusing on the inclusion of parents into the music therapy treatment process in the NICU; one study found that training mothers in the use of Music and Multi-modal Stimulation increased both the quantity and quality of maternal interactions with their premature infant in the NICU (Whipple, 2000). Music therapy literature is emerging on the use of music to address attachment and bonding between infants and caregivers, including infants considered developmentally at-risk (Bargiel, 2004; Creighton, Atherton, & Kitamura, 2013; de l'Etoile, 2006b; Edwards, 2011, 2014; Pasiali, 2012). However, no published music therapy studies have specifically explored the role of the father in the NICU and his attachment with his infant. In addition, while much is known regarding the musical characteristics of mother's infant-directed singing, infant-directed singing by the father has been less explored.

As the culture shifts to more egalitarian parenting, fathers are becoming more involved in childcare, with positive outcomes for both children and fathers. Nursing literature has expressed the necessity to understand father's unique needs and experiences in the NICU. There is a recognized need to develop more inclusive communication and practices, despite the barriers that fathers often experience regarding their presence in the NICU (Hugill, Letherby, Reid & Lavender, 2013; Johnson, 2008; Sisson, Jones, Williams & Lachanudis, 2015). Perhaps music therapy can meet fathers' unique needs and utilize fathers' strengths to achieve a secure attachment with their infant admitted to the NICU.

Music as an Evolutionary Tool

Music is a distinctly human behavior and is found in every culture. Despite music's universality, it is also very diverse, with differences found across cultures. Using music, specifically singing, to soothe an infant or attract his/her attention is a "universal caregiving behavior" that also is found throughout history (de l'Etoile, 2006b, p. 22). When compared to simulated infant-direct singing, true infant-directed (ID) singing is easily identified for listeners with and without musical training and/or childcare experience (Trehub, Unyk et al. 1997). Despite distinct cultural differences, lullabies share consistent musical characteristics that can be recognized cross-culturally (McDermott & Hauser, 2005). Infant-directed speech is also cross-cultural; in both infant-directed speech (i.e. "motherese" or "parentese") and infant-directed singing, caregivers alter temporal characteristics and pitch contour to capture their infant's attention and communicate emotional information (Trainor, Clark, Huntley, & Adams, 1997). Infants are responsive to music and exhibit proto-musical behaviors, or precursors to intentional musical behaviors. This may indicate that humans are predisposed to be musical (Cross, 2003) and that infants' preferences for lullabies are, to some degree, innate (McDermott & Hauser, 2005).

The origin of music, along with its evolutionary purpose, has been widely debated. Cross (2003) argues that music scaffolds social behaviors, starting with joint attention, and fills in the gaps for language, communicating meaning and emotion. It is likely that music and speech are not as differentiated for infants as they are for children and adults, and that infants attend to the musical aspects of speech (Masataka, 2009). Therefore, music may be innately preferred and adaptive, as seen in mother-infant interactions, ultimately providing social cohesion (Cross, 2001; McDermott & Hauser, 2005). Singing to an infant is a caregiving behavior that has its

roots in ancient times, signifying its universality and power. This may also indicate that it is somewhat natural for caregivers to sing to their infants. Music therapists may be able to encourage and shape this natural behavior even in an unnatural caregiving environment, such as the NICU, with atypically developing infants, such as premature or medically compromised infants.

Development and Use of Theory in Music Therapy

While writings on music and health emerged in the late 19th century, with interests in “curing” disease and in applications for institutional settings (Davis & Gfeller, 2008), music therapy as a discipline in the United States emerged from practice, followed later by research (Stige, 2015). When comparing music therapy to related disciplines, such as social work, nursing, counseling or speech therapy, music therapy is a newer discipline in the United States and the rest of the world. Music therapy research is continuing to develop and increase in quality and scope.

Historically, music therapy theory has aligned itself with the grand theories of psychology, including psychoanalysis, behaviorism, humanism and transpersonal psychology (Aigen, 2015). Later, Neurologic Music Therapy was developed with its theoretical basis in neuroscience (Aigen, 2015). As evidence-based practice emerged in the late 1990s, many music therapists embraced outcome-driven research, testing the effectiveness of music therapy interventions (Robb, 2012; Robb & Meadows, 2015). Detailed intervention reporting for music-based interventions is lacking, including those provided by music therapists and other professionals, as noted within pediatric settings (Robb & Carpenter, 2009), and with children with autism (Reschke-Hernández, 2012). In addition, outcomes-based research focuses solely on

the effectiveness of an intervention, and fails to capture the complexities of the mechanism of the intervention, in other words, how and why an intervention works (Robb, 2012).

In a recent research symposium, the American Music Therapy Association (AMTA) identified key needs for the future of music therapy research, addressing some of the concerns described above. One theme that emerged was “the need to further develop, integrate, describe, and link theory and theoretical models in music therapy research with well articulated and defined music therapy interventions” (American Music Therapy Association, 2015b, p. 11). This aligns with an editorial by Robb (2012) in the *Journal of Music Therapy*, which states that theory-based research is one way to capture the complexity of the music-based intervention. This can include the other variables involved in the music therapy process and the larger context (Robb, 2012). Therefore, theory-based research would be more transferrable to clinical practice (Robb, 2012).

Jaccard and Jacoby (2010) define a theory as “a set of statements about the relationship(s) between two or more concepts or constructs” (p. 28). Theory can be formal, with a large scope, or less formal and less generalizable (Ravitch & Riggan, 2012). Despite this range, a theory can be used to explain why and how things work (Ravitch & Riggan, 2012) and in this way it not only can describe, but also organize, predict and explain phenomena (Fleury & Sidani, 2012). The comprehensive nature of theory is desirable for music therapy research and goes beyond the question of “Does music therapy work?”

A theoretical framework is a theory or combination of theories regarding a phenomenon or problem (Ravitch & Riggan, 2012). Ravitch and Riggan (2012) propose that a conceptual framework is “an argument about why the topic one wishes to study matters, and why the means proposed to study it is appropriate and rigorous” (p. xiii). A framework reflects the complexity

of a phenomenon while providing clarity (Fleury & Sidani, 2012). It is not found, but is created, and guides the research process; at the same time, it is not static, but evolves (Ravitch & Riggan, 2012). A framework helps the researcher make and justify decisions, choose appropriate methodology and tools, and even guides the analysis and interpretation of data; ultimately, it supports “intellectual and methodological rigor” (Ravitch & Riggan, 2012, p. 14). Some researchers use the terms “theoretical framework” and “conceptual framework” interchangeably (Ravitch & Riggan, 2012). For the purpose of this study, a conceptual framework goes one step further and uses the theoretical framework to propose an action step or possible solution to a problem.

Purpose of the Study

The purpose of this study was to understand the unique experience of fathers with a premature infant admitted to the NICU in order to generate a conceptual framework, grounded in theory, for how music therapy intervention can increase secure father-infant attachment relationships. The theory-based conceptual framework was developed through a review of relevant research literature as an iterative process. Implications for further research and clinical practice were also explored.

Chapter 2

Review of Literature

The review of relevant research literature will be a critical part of the theory-based conceptual framework developed in this study. In order to understand fathers' unique experiences of having a premature infant admitted to the NICU, the literature reviewed will include an overview of the process of transitioning to fatherhood, the experience of fathers in the NICU setting and the importance of patient- and family-centered care in the NICU. Music therapy practice will also be examined, including the emergence of music therapy research and practice in the NICU, as well as the literature regarding attachment and bonding and the use of paternal voice through infant-directed singing for full-term and premature infants. These constructs, as represented in the extant literature, will explore how and why a music-based intervention can increase secure father-infant attachment relationships for premature infants in the NICU.

Transition to Fatherhood

The transition from partner to parent is one of great changes for both mothers and fathers. For fathers specifically, it is a significant and challenging developmental shift, characterized by psychological reorganization, stress and mixed emotions (Chin, Hall, & Daiches, 2011; Deave & Johnson, 2008; Singley & Edwards, 2015; Slade, Cohen, Sadler & Miller, 2009). This review will follow the fathers chronologically through the three main stages of transition: the prenatal period, the birth experience and the postnatal period.

Prenatal period. The transition to fatherhood begins at pregnancy, the most stressful of the three stages of transition (Genesoni & Tallandini, 2009). Both mothers and fathers may experience a feeling of disbelief in the beginning stages of pregnancy; however, fathers have a

more difficult time forming a representation and relationship with the fetus, likely due to the absence of his own physical and physiological changes, despite the fact that his partner is going through these changes (Genesoni & Tallandini, 2009; Slade et al., 2009). What was once a female-only experience now includes the expectation that men participate in the process of pregnancy. Fathers would like to be involved, but also have feelings of ambivalence (Genesoni & Tallandini, 2009), likely due to the fact that during prenatal appointments and classes, fathers often feel left out (Chin et al., 2011) and that the information provided is not specific for fathers (Deave & Johnson, 2008). Similarly, fathers struggle to fit prenatal classes into their schedules or take time off work (Deave & Johnson, 2008).

Another factor that may lead fathers to feeling like outsiders in prenatal classes is the format of such classes. Many prenatal classes are formatted to include discussion groups. This may not be natural for fathers, who, unlike mothers, may not have experience talking about pregnancy and childbirth in a group setting (Plantin, Olukoya, & Ny, 2011). Mothers' and fathers' experiences at the very beginning of the process of becoming a parent seem to diverge. The question becomes how each member of the couple influences the other during this beginning period of parenthood.

The relationship between partners changes due to the nature of the commitment needed to raise a child. These changes can be positive and strengthening and/or stressful on the relationship (Chin et al., 2011; Slade et al., 2009). A healthy relationship, or one with higher satisfaction ratings from the father, has a positive impact on the father's feeling of being involved with the pregnancy and in future childcare (Genesoni & Tallandini, 2009; Slade et al., 2009). It is important to note that the relationship between partners is likely more affecting for a father's relationship with his child than for the mother-child relationship (Slade et al., 2009).

At this time, both parties begin to see themselves as parents and begin to make decisions about their new roles, often referencing how they were parented (Genesoni & Tallandini, 2009; Slade et al., 2009). Fathers often choose to parent exactly how they were parented or in the opposite way that they were parented (Chin et al., 2011; Slade et al., 2009). Wanting to be a father in opposition to how they were parented is indicative of the cultural shift that is occurring for fatherhood. Societal changes in marriage and divorce rates, the rise of feminism, gender equality and women in the work force has coincided with the redefining role of fathers and paternal involvement in childcare (Plantin et al., 2011). As more egalitarian couples become egalitarian parents, fathers are becoming more involved in childcare when compared to previous generations (Chin et al., 2011; Genesoni & Tallandini, 2009).

However, due to this societal change, modern fathers often do not have role models (Deave & Johnson, 2008; Singley & Edwards, 2015). Likewise, differences in paternal and maternal parenting styles remain (Genesoni & Tallandini, 2009), despite the evidence that when gender is isolated, such as with single parents, there are no differences in parenting styles between genders (Biblarz & Stacey, 2010). While the role of the father is shifting in society, previous roles, such as that of the provider, do not disappear but instead remain in the cultural identity of fatherhood (Singley & Edwards, 2015). This is not, then, a true shift, but is additive; the father simply has more expectations added to his role in the family.

The lack of role models also extends to a general feeling of a lack of support for fathers during the prenatal period (Deave & Johnson, 2008). The lack of information geared towards fathers, role models and support likely contributes to the overall feeling of being unprepared for fatherhood (Deave & Johnson, 2008). Feeling unprepared for fatherhood may contribute to decreased parental self-efficacy (Plantin et al., 2011; Singley & Edwards, 2015). Men also

experience prenatal depressive symptoms more frequently than during the postpartum period; lack of support as well as poor relationship satisfaction may contribute as risk factors (Singley & Edwards, 2015).

Birth. The labor and delivery of a child is an event that solicits a variety of strong emotions for fathers. Similar to the prenatal period, fathers continue to feel excluded and uncertain of their role during the birthing process (Chin et al., 2011; Deave & Johnson, 2008; Genesoni & Tallandini, 2009). Helplessness and anxiety are common emotions described in the literature (Genesoni & Tallandini, 2009). Fathers were also exhausted by the length and intensity of the time spent in the hospital (Deave & Johnson, 2008), which may have been unexpected (Genesoni & Tallandini, 2009). This likely relates to the lack of information that fathers received during the prenatal period.

A birth may also be experienced as a traumatic event. There is no singular definition of a traumatic birth or birth trauma (Elmir, Schmied, Wilkes & Jackson, 2010). Mothers who experience birth trauma can feel helplessness, loss of control, and fear (Beck, 2004). A range of experiences, including premature birth, may be perceived as traumatic (Elmir et al., 2010). The perceived experience is more important (Beck, 2004). The consequence of birth trauma for mothers may be posttraumatic stress disorder (PTSD) (Beck, 2004). Mothers may also experience disconnect from their partners and infants (Elmir et al., 2010). This may affect the mother's ability to bond with her infant due to negative emotions toward the baby (Elmir et al., 2010). Alternately, mothers may also become overprotective of their infants, as a way to atone for the experience (Fenech & Thomson, 2014).

Fathers may also experience symptoms of trauma as the result of a complicated or traumatic birth. They may also feel in shock, helpless and powerless (Elmir & Schmied, 2016).

Men also felt that they were not able to fulfill their role as provider and protector, resulting in the feeling of guilt (Elmir & Schmied, 2016). The trauma experience may also impact the partner relationship (Elmir & Schmied, 2016), similarly to the mothers' feelings of disconnect. Fathers may also experience PTSD (Bradley & Slade, 2011).

Postnatal period. The postnatal period is when fathers start to integrate their experiences with their expectations, and move into a socially performative role of fatherhood (Genesoni & Tallandini, 2009). Fathers seeking balance between home and work, or participating in childcare and providing for the family characterize the postnatal period. Without role models for their ideal image of fatherhood, this transition can be difficult. Many feel that their workplace demands do not allow for reprioritization of their time (Genesoni & Tallandini, 2009). Going back to work is difficult (Chin et al., 2011) and fathers may feel excluded from the home experiences once they return to work (Deave & Johnson, 2008). Fathers report less free time and many feel this is a time when they become more mature. They also experience an increase in their self-care and have a decrease in risk-taking behaviors (Chin et al., 2011). Time is needed to establish a bond with their infant and therefore, less time is spent with their partner (Genesoni & Tallandini, 2009). Stress is exacerbated with father's lack of sleep (Chin et al., 2011). Despite fathers' best intentions, they do not always change their habits when the infant is home, or bring their ideal image of fatherhood to fruition (Genesoni & Tallandini, 2009).

Fathers often cope with the stress of the new baby by learning and perfecting a parenting skill, which helps them develop their identity as a father. Fathers may also start to develop a distinct paternal parenting style at this time (Chin et al., 2011). However, mothers have an impact on the father's view of his role, often acting as a gatekeeper for the father's involvement (Genesoni & Tallandini, 2009). It has been suggested, though, that as parental roles become

more egalitarian, the mother's role as gatekeeper may begin to diminish (Cabrera, Tamis-LeMonda, Bradley, Hofferth, & Lamb, 2000). A positive relationship between partners has a positive impact on fathers during this period (Genesoni & Tallandini, 2009). Relationship stress, often unexpected (Deave & Johnson, 2008), can be alleviated by spending time together as a couple (Chin et al., 2011).

Men can experience paternal postpartum depression (PPD), which is only emerging in research literature (Musser, Ahmed, Foli & Coddington, 2013). The incidence rate is reported with wide variability (Musser et al., 2013; Singley & Edwards, 2015). The variability may result from the lack of a specific definition of paternal PPD (Musser et al., 2013) and specific diagnostic tools (Singley & Edwards, 2015). Fathers likely express PPD differently than mothers (Singley & Edwards, 2015) and with less obvious symptoms (Musser et al., 2013). Similarly, fathers may not be aware that they are at risk for PPD (Musser et al., 2013).

Fathers are at the highest risk for PPD within 3-6 months after the infant's birth (Musser et al., 2013; Singley & Edwards, 2015). Maternal PPD is a risk factor for paternal PPD (Musser et al., 2013; Singley & Edwards, 2015); the reverse is likely true, considering that the lack of social support often is a risk factor for depression (Musser et al., 2013). The consequences of paternal PPD include an increased risk for family stress and child psychopathology, with decreased rates of father and child bonding (Musser et al., 2013). Negative parenting outcomes increase when both parents have postpartum depression (Musser et al., 2013).

Throughout the prenatal period, birth and the postnatal period, experiences of exclusion, lack of support and information, and the feeling of unpreparedness arise. The impact that the partner relationship has on the father's involvement in caregiving is striking. Cultural influences also shape fathers in several ways: First, by indicating roles that are additive, such as the roles of

provider and caregiver; secondly, creating a need for balance at work and home; and lastly, the lack of role models for egalitarian parenting. While it is clear that the transition to fatherhood shares some similarities with becoming a mother, it is important to recognize that fathers have a unique experience, distinct from the mother's experience.

Attachment Theory and Fatherhood

Attachment theory was developed by John Bowlby and expanded by Mary Ainsworth in the mid-20th century with specific emphasis on the mother and infant relationship (Palm, 2014); the mother acts as the infant's secure base or safe haven (Condon, Corkindale, Boyce & Gamble, 2013). Attachment theory has psychoanalytic roots. John Bowlby's training in child psychiatry was influenced by Melanie Klein, co-founder of object relations theory, and Mary Ainsworth's training was influenced by Sigmund Freud and William Blatz's security theory (Bretherton, 1992). Bowlby later split with Klein, recognizing the importance of the lived experience (in contrast to imagined fantasies), influenced by his work with children who had experienced the absence of their parents in post-World War II England (Beckett & Taylor, 2010; Bretherton, 1992). Later, Bowlby was greatly influenced by ethology and the idea that infants are biologically and innately programmed to form relationships with their caregivers in order to meet their needs and survive (Bretherton, 1992; Palm, 2014). Mary Ainsworth helped to develop the categories of attachment and the first attachment assessment, the Strange Situation Protocol (SSP), influenced by extensive naturalistic observation of infants and mothers (Bretherton, 1992; Palm, 2014). Attachment theory later expanded to include the importance of infants' relationships with other caregivers, including fathers (Palm, 2014).

A caregiver that is consistent in responding to an infant's needs infants creates a secure attachment figure or secure base for the infant. From this relationship, the infant begins to

develop an internal working model for this relationship and future relationships (Beckett & Taylor, 2010). This internal working model is difficult, but not impossible to change (Palm, 2014). A responsive caregiver shows sensitivity to the infant's cues, accurately identifying the infant's needs and responding appropriately. An aspect of sensitivity is synchrony or mirroring (Beckett & Taylor, 2010; Palm, 2014), defined as face-to-face coordinated behaviors between the infant and caregiver (Palm, 2014). The relationship between the attachment figure and the infant is reciprocal; both parties gain from the interaction with one another. The parent's state of mind, assessed through the Adult Attachment Interview (AAI), also plays a role in the quality of attachment between the infant and caregiver (Palm, 2014). The AAI determines the caregiver's views on parenting, based on their perceptions of being parented, an indication that attachment patterns may be intergenerational (Palm, 2014).

Attachment theory has drawn criticism. The argument that attachment theory is anti-feminist is not without justification. The origins of the theory were mother-centered, which can be understood to be a product of the time period. Attachment theory may have become popular in its wartime period because more women were working and it could be used to get women back in the home and out of the workforce (Beckett & Taylor, 2010). This is an inaccurate interpretation of the theory; infants can attach to one or a few caregivers, including those outside of the parental dyad, such as grandparents and even those outside of the family, in the case of day-care workers (Beckett & Taylor, 2010; Bretherton, 1992). However, many studies have, and continue to focus on the mother, which may further lead to this criticism.

The view of fathers as attachment figures has changed over time. Bowlby saw fathers as more playful and secondary to the nurturing maternal figure. At the time the theory emerged, a father was seen as the primary attachment figure only if the mother was unavailable (Palm,

2014). The perspective shifted from hierarchical to egalitarian in the 1960s and 1970s, noting that fathers were as important as mothers, although they exhibited different attachment behaviors than mothers. The development of the Adult Attachment Interview in the 1980s showed that the maternal and paternal relationship patterns were both important for the child's development, but different from one another, suggesting gender equality, or the importance of both parents (Palm, 2014).

Assessments of infant-caregiver attachment often focus on the infant's behaviors, such as with the Strange Situation Procedure; this is not as consistent for fathers as it is for mothers as a predictor of the quality of attachment (Condon et al., 2013). Parental sensitivity does focus on parent behaviors, but the relationship between parental sensitivity and father-infant attachment is also a weaker relationship in comparison to mothers (Condon et al., 2013; Lucassen et al., 2011). Theorists have hypothesized that this could be due to the playful nature of paternal caregiving (Lucassen et al., 2011). However, a meta-analysis by Lucassen et al. (2011) found no statistical difference regarding the association between sensitivity measures and secure attachment when more playful behaviors were taken into account. Measures of sensitivity, specifically focused on the father-infant dyad, likely fail to capture the complex influence of the entire family unit, or at the least, the influence of the co-parent (Lucassen et al., 2011).

Prenatal attachment can be assessed by the Maternal Antenatal Attachment Scale or the Paternal Antenatal Attachment Scale, both developed by Condon and Corkindale in 1997 (Condon et al., 2013). The self-report questionnaire is similar to the Adult Attachment Interview in that it assesses the parents' thoughts and feelings (or internal working model) for their future baby. A 2013 study of Australian fathers by Condon et al. found, similarly to mothers, first-time fathers' prenatal attachment (father-fetus attachment) is a strong predictor of postnatal

attachment (father-infant attachment). The other strong predicting factor of the quality of the father-infant relationship is the quality of the partner relationship. In a study of Taiwanese first-time fathers, marital intimacy and partner support scores were predictive for father-infant attachment (Yu, Hung, Chan, Yeh, & Lai, 2012). The findings align with the literature regarding the transition to fatherhood and the importance of the partner relationship (Genesoni & Tallandini, 2009; Slade et al., 2009). This may also indicate that attachment is not only formed through interactions with the infant, but also is related to the father's conceptualization of himself as a father and his views of his infant. These findings also acknowledge the importance of prenatal classes specifically for fathers, which may help develop prenatal attachment (Condon et al., 2013).

As discussed earlier, new fathers do not always have role models for egalitarian parenting and often choose to parent in the opposite way they were parented (Chin et al., 2011; Slade et al., 2009). The "reworking of insecure attachment representations" can facilitate positive attitudes about involvement in care and can positively impact father-prenatal attachment (Slade et al., 2009, p. 28). On the other hand, some fathers feel that their own experience of being parented is exactly how they plan to be as a father (Chin et al., 2011; Slade et al., 2009). A secure attachment as a child can also positively affect the father's ability to develop a father-prenatal attachment (Slade et al., 2009).

The NICU: A Father's Perspective

While the mother's experience of having an infant admitted to the NICU has been explored in the literature, less is known about the father's unique experience in the setting (Binder et al., 2011; Hugill, et al., 2013; Sisson et al., 2015). The NICU can be an intimidating and stressful environment (Sisson et al., 2015); the physical space, including monitors and

biomedical equipment, may be a barrier for father involvement by limiting physical contact and disrupting typical bonding or care experiences (Johnson, 2008). Proximity, defined as physical closeness and physical touch is a positive attribute desired by fathers in the NICU (Sisson et al., 2015). However, fathers describe the environment, as well as the fragility of the infant, as barriers to proximity, a negative aspect of the NICU experience for fathers (Sisson et al., 2015).

In addition to the physical space, parents need to learn to navigate new relationships with the medical providers and find meaning in being a parent in this environment through different levels of involvement. Not having enough information and ineffective communication between medical staff and parents, as well as among the medical staff themselves are themes that emerge throughout the literature regarding both mothers and fathers (Johnson, 2008). Communication may not be provided in a way that is amenable to the father's lifestyle; for example, when a father is driving to and from the NICU and his workplace, lengthy written information may take too much time to read (Sisson et al., 2015). Communication also influences other parts of the experience, such as knowing if and when it is acceptable to touch the infant (Sisson et al., 2015). When fathers are given more information, it is likely that they will feel more included in their infant's care (Sisson et al., 2015).

Mothers' emotional experiences likely influence fathers' experiences in the NICU. A longitudinal observation study found a significant correlation between the degree of posttraumatic stress symptoms experienced by mothers and those experienced by fathers regardless of infants' age or severity of illness (Binder et al., 2011). The results are in tandem to the literature regarding post-partum depression—one parent's symptomology may put the other parent at risk (Musser et al., 2013; Singley & Edwards, 2015). Thus, it is important to include both parents in care.

Fathers value information and encouragement to participate in their infant's care, but many felt excluded with the needs of the mother taking precedence (Sisson et al., 2015). Such feelings of exclusion may be connected with fathers' decreased feelings of confidence and autonomy in the NICU (Sisson et al., 2015). This is not surprising, considering the literature for the typical experience of becoming a father also shares these themes of exclusion (Chin et al., 2011; Deave & Johnson, 2008; Genesoni & Tallandini, 2009). However, there is also a connection with mothers' experience of being an outsider for the care of their infant in the NICU as well, which may indicate that the NICU is an environment that feels exclusionary for both parents (Johnson, 2008), possibly more so for fathers than mothers.

Despite these recommendations to be more inclusive of fathers in care, there may be logistical and cultural challenges that influence the father's physical presence in the NICU. Fathers typically take on the role of provider, even when the family is in crisis, and continue to seek a work and family balance (Jackson, Ternstedt & Schollin, 2003). Fathers also lack confidence and the feeling of autonomy in the NICU (Sisson et al., 2015), and may feel more confident in their work, possibly leading them to be less present at the infant's bedside (Johnson, 2008). This represents a physical and emotional distance for fathers. Hugill et al. (2013) found that English fathers fell back on stereotypical male behaviors, such as lack of emotional expression, or avoiding caregiving tasks seen as feminine, as a way to protect themselves from emotional pain. Similarly, Sisson et al. (2015) found that fathers reported feeling frightened but wanted to be perceived as "the strong family member who was there to protect the family" (p. 476).

A qualitative study about fathers of infants from two NICUs in Canada found that fathers fell into distinct involvement patterns in terms of the amount of time spent in the NICU and their

interactions with their infants. The multi-case study classified the fathers as “equal to mother” or that the “mother is more important.” The third category was labeled, “reluctant.” When fathers saw themselves as an equal parent, they described more intrinsic motivation for their interactions with their infant. They were more physically present in the NICU and more directly involved with their infant’s care. Fathers who viewed “mothers as more important” spent less time at the NICU and offered spousal support and other indirect support, such as taking care of household duties. These fathers described a mix of intrinsic and extrinsic motivation for caring for their infant. “Reluctant” fathers were less willing to be involved in the NICU and did so mostly from extrinsic sources, such as encouragement from staff or the mother. Fear was salient for this group of fathers. This included fear for the infant’s current medical condition and possible future disability. Fathers were also afraid of handling and interacting with the infant (Feeley, Sherrad, Waitzer & Boisvert, 2013).

A distinct difference between the first two groups is that the fathers who viewed themselves as equal to the mother had taken leave from work and spent more time in the NICU. The second group, “mother is more important,” continued to work and visited in the evening. Surprisingly, the “reluctant” group was a mix—some fathers worked while others had taken leave. While the economic implications cannot be ignored, the father’s view of his role clearly impacts his involvement despite his ability or inability to take a paternal leave. The study also is a reflection of culture; other cultures, including the U.S., likely have different ideals and norms regarding paternity leave and parental roles.

Many of the above studies make recommendations for improving care. Perhaps most simply, it is important for staff to understand the experience and perspective of fathers in the NICU (Johnson, 2008; Sisson et al., 2015). Staff should consider and treat both parents in the

NICU for stress, trauma and/or post-partum depression, due to the influence of the co-parent relationship (Binder et al., 2011). Similarly, offering the father equal participation in care is also recommended (Sisson et al., 2015), although it is important to recognize that fathers may desire to participate in different quantities and in different ways (Feeley et al., 2013). Researchers also recommend making communication more father-friendly, as well as encouraging fathers to interact with other fathers in the NICU (Sisson et al., 2015). In addition, how health care professionals view fatherhood may impact how they perceive a father's behaviors and role in the NICU (Hugill et al., 2013). Both the literature of an expected transition to fatherhood and becoming a father of an infant in the NICU shows that it would benefit the father to increase his involvement in prenatal preparation (Hugill et al., 2013) and create a plan of care for the delivery, immediately post-birth and the future (Johnson, 2008). The above recommendations also fit within the model of patient- and family-centered care in the NICU.

Patient- and Family-Centered Care in the NICU

Family-centered care emerged in the medical setting, including the NICU, in the 1990s (Gooding et al., 2011; Institute for Patient- and Family-Centered Care, 2010). The terminology recently changed to include a more explicit role for the patient (Institute for Patient- and Family-Centered Care, 2010). Patient- and family-centered care (PFCC) redefines the relationships for patients, families and health care professionals, acknowledging the role of emotional and social support and the importance of the family and (Institute for Patient- and Family-Centered Care, 2010). The terms “family-centered care” and “patient- and family-centered care” may be used interchangeably, but the current terminology, PFCC will be used in this study.

Every NICU has a distinct culture, perhaps partially due to the differences in implementation of PFCC, but the high rates of parental distress that still exist may indicate that

there is room for improvement (Gooding et al., 2011). Communicating and educating parents about their infant is an aspect of PFCC, so the role of the medical staff is an important mechanism for PFCC in the NICU (Gooding et al., 2011). Online support may also be a method to improve PFCC in this setting and may answer some of the problems identified with communication (Gooding et al., 2011). As noted above, this aligns with the research that recommends increasing communication with fathers in father-friendly ways (Sisson et al., 2015).

The physical layout and design of NICUs may impact family-centered care (Beck, Weis, Greisen, Andersen, & Zoffmann, 2009; Gooding et al., 2011) and may promote a family's presence and participation in care (Gooding et al., 2011). Participating in care can include decision-making, as well as direct participation in caretaking tasks such as diapering, feeding and Kangaroo Care (Gooding et al., 2011). These aspects have connections with the recommendations expressed in the previous section including explicitly increasing the understanding of fathers in order to meet their needs. Increased participation from both mothers and fathers will support improved patient- and family-centered care in the NICU (Cockcroft, 2012) and offer the father equal participation in direct and indirect care (Sisson et al., 2015).

PFCC in the NICU setting has positive outcomes for attachment and bonding, as well as infant health, length of stay, and family and staff satisfaction (Cooper et al., 2007; Gooding et al., 2011). When mothers have a positive relationship with NICU staff, they are likely to feel more satisfied with their care and are more likely to seek help from staff (Van Riper, 2001). This may have a great impact on the well-being of mothers and fathers. Research literature is beginning to emerge about mothers receiving counseling or psychosocial services on the NICU, indicating that there is a high need to receive such services (Friedman et al., 2013). However, no current published literature analyzes the incidence and experience of fathers receiving these services on

the NICU. Significantly, fathers often express their emotions differently and less outwardly (Hugill et al., 2013), which may decrease their chance of referral for psychosocial services such as counseling. Treating the whole family, including both parents, fits within the model of PFCC and is recommended due to the important influence of the co-parent relationship on PPD and parental outcomes (Binder et al., 2011).

Music Therapy in the NICU

Music therapy research and practice in the NICU began by focusing primarily on the effectiveness of music therapy techniques for infant outcomes, particularly on physiological measures, such as heart rate, respiratory rate, and oxygen saturation (Shoemark, Hanson-Abromeit & Stewart, 2015). More recently, music therapists have acknowledged the importance of patient- and family-centered care in the music therapy process, and that music therapy intervention can be beneficial to both infant and parent (Loewy, 2015; Shoemark & Dearn, 2008). Many of the recommendations for improving care for fathers in the NICU can be transferred to the music therapy process, such as offering fathers the opportunity to participate in music therapy. To increase fathers' involvement in prenatal preparation, a music therapy department may provide a continuum of care in a medical setting, especially for pregnancies considered "at-risk."

Music therapy applications in the NICU are beginning to incorporate other theoretical frameworks outside of the biomedical model, including attachment (Shoemark et al., 2015). Emerging music therapy literature that addresses attachment and bonding is primarily focused on typically developing infants (Creighton et al., 2013; de l'Etoile, 2006b; Edwards, 2011, 2014). Other studies have looked at developmentally at-risk infants (Bargiel, 2004), maternal training in the NICU (Whipple, 2000), older children who experienced neglect (Jacobsen, McKinney, &

Holck, 2014), adoptive families (McAlpin, 2013), and young children and parents with low socioeconomic status (Pasiali, 2012). Published music therapy literature focused on promoting attachment specifically with fathers and infants, or for fathers and premature infants in the NICU has not been found.

Infant-directed singing: A music therapy intervention strategy. Research regarding infant-directed (ID) singing began to emerge in the 1990s with Sandra Trehub and later Laurel Trainor, whose pivotal research became the basis for Shannon de l'Etoile's 2006 theoretical framework regarding infant-direct singing with implications for music therapy (de l'Etoile, 2006b). ID singing has distinct musical characteristics including a higher pitch, slower tempo, more rhythmic quality, expressivity as shown by variations in pitch, volume and tempo, and finally, is sung with emotional warmth (de l'Etoile, 2006b; Trehub, Unyk et al. 1997). There are two distinct types of ID singing: lullabies and play songs (de l'Etoile, 2006b). The functions of each type of ID singing differ, as do the musical qualities.

Play songs are used to stimulate and gain the infant's attention; lullabies are for soothing and comfort. Trehub, Unyk et al. (1997) found that parents reported using more play songs, followed by lullabies, popular songs and invented songs. Parents often sang while performing other activities, including playing, feeding, preparing for bed, and more. Play songs have more variation in pitches and are more rhythmic when compared to lullabies (Trainor et al., 1997). The musical qualities of a lullaby include smooth, descending melodic contours; a limited pitch range; small intervallic changes; a rhythmic style; and are sung with a "loving tone of voice" (de l'Etoile, 2006b, p. 23).

Tsang and Conrad (2010) found that infants preferred higher pitched play songs and lower pitched lullabies. Preference was assessed by infants' head turning behavior and looking

time towards the stimuli. This finding is in contrast to other studies that indicate infant-directed singing is always higher pitched. These findings suggest that the context of a song is important and that pitch, when paired with other musical elements, may communicate emotional information. Similarly, Volkova, Trehub and Schellenberg (2006) found that infants prefer lullabies sung in a lower pitch range when compared to a higher pitch range. These are relative comparisons and the exact frequencies of the pitches were not reported. The researchers also suggest that pitch may not truly be able to be isolated for singing, and that a change in pitch would also coincide with a change in the singer's tone or timbre (Volkova et al., 2006). This may be especially true for parents who have little or no formal vocal training. Infants also preferred play songs with a faster tempo when compared to the same play song in a slower tempo; infants did not appear to have a preference for lullabies (Conrad, Walsh, Allen, & Tsang, 2011). More needs to be known about infants' perception and preferences for different musical elements for each type of ID singing.

An intervention strategy to help increase mothers' sensitivity to their infants' cues includes a music therapist coaching the mother on how best to use ID singing to attract the attention of her infant (de l'Etoile, 2006b). The therapist could also model this interaction (de l'Etoile, 2006b). With the guidance of the music therapist and feedback from the infant, the mother would learn how to modulate specific musical elements in response to her infant's needs, ultimately starting a positive feedback loop between the infant and the mother (de l'Etoile, 2006b).

The primary focus of much of this scholarship has been on mothers and female voices, including mothers of typically developing infants (de l'Etoile, 2006a, 2006b), mothers with depression (de l'Etoile, 2011) and mothers of babies with Down syndrome (de l'Etoile, 2015).

While this has shed light on the acoustical characteristics of infant-directed singing by mothers, as well as infant preferences, there have been considerably fewer studies that have analyzed the musical characteristics of infant-directed singing by fathers. Several of these studies are Canadian and from the late 1990s and early 2000s (O'Neill, Trainor, & Trehub, 2001; Trehub, Unyk, et al., 1997), and may not reflect the current realities of ID singing for current fathers in the U.S.

Mothers use significantly more infant-directed speech when compared to fathers (Johnson, Caskey, Rand, Tucker, & Vohr, 2014), which may partially explain infants' preferential responses to mothers' voices. It stands to reason that this would be parallel to ID singing. Trehub, Unyk, et al. (1997) found that out of 67 families, 26% of fathers sang "often or always" in comparison to 72% of mothers. The percentages are virtually reversed for parents who sang "occasionally or rarely", with 74% of fathers and 28% of mothers singing "occasionally or rarely" to their infants.

Researchers asked 14 mothers and 13 fathers from different families to record themselves singing in their home, with half instructed to record themselves singing in the presence of their infants (infant-directed or ID) and the other half without, but simulating infant-directed singing (infant-absent, or IA). Both mothers and fathers had a higher pitch and slower tempos for the ID singing group. For both groups, fathers had a lower pitch range and slower tempos in comparison to mothers. Listeners were able to identify the differences between the two groups with a slightly higher accuracy level for mothers (72%) compared to fathers (69%). The use of a slower tempo and, anecdotally, vocal quality or timbre seemed to influence listeners accuracy (Trehub, Unyk, et al., 1997). Similarly, O'Neill et al. (2001) found that listeners identified ID singing by the slower tempo, quieter volume and a "loving tone" (p. 416).

Using the same recordings, the researchers asked a new group of listeners to identify the level of emotional engagement of the singers on a 9-point scale, with higher scores indicating higher emotional engagement. ID singing was more emotionally engaging with no differences found due to the gender of the singer. This indicates that while some musical characteristics may be different for mothers and fathers, both parents seem to communicate similar emotional information through their singing. This was also apparent to a variety of listeners with different musical and childcare backgrounds (Trehub, Unyk, et al., 1997).

Mothers and fathers chose different kinds of songs to sing to their infant in this study. Mothers were more likely to choose traditional children's songs, while fathers were more likely to alter popular or folk (adult) music or create complex songs for their infants. The researchers hypothesized that this may have something to do with the differences in exposure to children's songs for each gender (Trehub, Unyk, et al., 1997). The use of non-traditional lullabies for ID singing aligns with music therapist and researcher Joanne Loewy's "song of kin" concept. This is often a parent-chosen song, one that may be important to the family's culture or a song that has been passed on through generations (Loewy, 2013). It also acts as an anchor for the parents by creating a positive memory that can help parents feel more in control due to the trauma of a premature birth (Health Professional Radio, 2013). Loewy has also described song of kin as a transitional object, an idea from Winnicott's object-relations theory (Hanson-Abromeit et al., 2008). When applied to adults, a transitional object is defined as "any person or thing that provides security, emotional well-being, and a symbolic connection with a valued other" (VandenBos, 2015, p. 1102). In this case, the object is a song.

Loewy (2015) analyzed the differences between song of kin and the traditional song "Twinkle, Twinkle, Little Star." The results are mixed for infant outcomes, with an overall

higher oxygen saturation rate for “Twinkle,” but when different infant diagnoses are taken into account, “Twinkle” was more effective for increasing oxygen saturation rates for infants with sepsis, and song of kin was more effective for breathing patterns for infants with respiratory distress. Infants who had received the song of kin intervention had a significantly higher caloric intake. For parents, the measure of parental stress was significantly reduced after singing a lullaby to their infant; the results were not reported for differences between “Twinkle” and song of kin for this measure. It is possible that “Twinkle” could also be considered a song of kin for some families. While these are interesting findings, more studies are needed to differentiate infant outcomes based on song type and characteristics, as other variables could account for these outcomes.

A further study by Trehub, Hill and Kamenetsky (1997) indicates that infant sex¹ makes a difference, more so for fathers than mothers. Mothers were more playful overall, while fathers sang more playfully to their infant sons and more soothingly to their daughters. Mothers were relatively the same for both sexes. This is parallel to the literature indicating that fathers reinforce stereotypical gender characteristics and activities more so than mothers (Lytton & Romney, 1991), although this may only account for explicit behaviors and not implicit beliefs about gender (Endendijk et al., 2013). More current research is needed to reflect the shifting cultural climate in the United States to determine if this is still the case.

If music therapists coach parents on the use of ID singing (de l’Etoile, 2006b), then the gender of the music therapist should also be taken into consideration. Music therapy is a female-

¹ Note the distinction between sex and gender in this manuscript. Sex indicates the biological and physiological characteristics of the infant. Gender indicates the social construct.

dominated profession in the United States. In the most recent workforce analysis by the American Music Therapy Association (AMTA), out of the 1,522 members surveyed, 87.6% were female, 11.8% male, less than 1% were transgender, and less than 1% identified as “other” (American Music Therapy Association, 2015a). For music therapists of any gender to best serve parents of any gender, in a true definition of family-centered care, it could be hypothesized that music therapists would need to account for their own gender and the gender of the parent or caregiver(s) when designing music therapy interventions for a premature infant admitted to the NICU.

Loewy (2015) indicates that music therapists of female and male genders matched the vocal range of mothers and fathers. The presence of transgender therapists or parents was not indicated. The different vocal ranges are identified as soprano, alto, tenor, and bass. Differences in infant outcomes when accounting for the genders of parents or therapists were not reported. Loewy’s reasoning to match the parent’s vocal range, instead of using a higher, female vocal range, is that infant’s preferences for pitch may depend on the context, specifically the type of song (Tsang & Conrad, 2010). Loewy also argues that preterm infants may find their parents’ voices familiar and that ID singing, as a therapeutic intervention, should match the parents’ vocal range. Research is showing that full-term infants are able to perceive and remember their mothers’ voices, rhymes, poems and music that they have heard in the womb (for review see Ullal-Gupta, Vanden Bosh der Nederlanden, Tichko, Lahav, & Hannon, 2013). However, this research, based on full-term infants’ experiences and behavior, may not easily transfer to premature infants.

Full-term infants have exposure to a wide variety of sounds in the womb, including both parents’ voices and music with most auditory development occurring in the third trimester

(Kisilevsky et al., 2003; Ullal-Gupta et al., 2013). This is disrupted when an infant is born prematurely. Kisilevsky et al. (2003) argue that in utero auditory experiences are key for future language development. Because the NICU is a much different auditory environment than the womb, preterm infants may benefit from exposure to speech and music in the NICU. More research is needed to determine if this is the case. Lastly, fathers may make connections earlier than if the infant was born at term. Admittance to the NICU may allow fathers to start bonding with their infant earlier than anticipated with music as a tool to connect with their baby.

Problem Statement

A secure attachment is a protective factor that influences a child's emotional development and future relationships; an insecure attachment is a risk factor for future psychopathology (Zeanah & Smyke, 2009). Due to the stressful nature of the NICU environment and the trauma of a premature birth, fathers and mothers are at risk for developing insecure parent-infant attachments with their premature infants. Although the focus in the NICU and in research is often on mothers, fathers have a distinctly different experience of becoming a parent in the NICU. In addition, fathers experience a variety of unique influences that may shape the way they think about and interact with their infant. Music therapy, including infant-directed singing, may be a natural way for parents to bond with their baby in this setting. Fathers show different behaviors when interacting with their infants through ID singing. The purpose of this study was to understand the unique experience of fathers with a premature infant admitted to the NICU in order to generate a conceptual framework, grounded in theory, for how music therapy intervention can increase secure father-infant attachment relationships.

Chapter 3

Theoretical Framework

Fatherhood is a role that is influenced by many aspects, from individual idiosyncrasies to greater cultural expectations. The purpose of this study was to understand the unique experience of fathers with a premature infant admitted to the NICU in order to generate a conceptual framework, grounded in theory, for how music therapy intervention can increase secure father-infant attachment relationships. The iterative review of literature was used to identify the key constructs relevant to the father's unique experience in this setting. This chapter defines the formal theory, ecological systems and causal models, a structure for theory construction. Causal modeling was used to construct the conceptual framework within the context of ecological systems theory. The Results chapter defines the variables and places them in context of ecological systems theory to form the theory-based conceptual framework for a music-based bonding intervention for fathers with premature infants in the NICU. Strengths and limitations, as well as implications for music therapy practice and research, are discussed in the final chapter.

Ecological Systems Theory

Urie Bronfenbrenner developed ecological systems theory as a theory of lifespan development with the focus on the individual's perception of, interaction with, and influence from the environment. Both the individual and the environment are dynamic and each reciprocally accommodates the other (Bronfenbrenner, 1979). Bronfenbrenner was greatly influenced by Kurt Lewin's topological theories and Piaget's "construction of reality" (Bronfenbrenner, 1979, p. 9). Bronfenbrenner's theory counters the study of an isolated individual in an unnatural laboratory setting (1979).

Instead, Bronfenbrenner introduced four interconnected, nested systems: microsystem, mesosystem, exosystem, macrosystem. Later, to account for the influence of time, Bronfenbrenner introduced the chronosystem (Bronfenbrenner, 1986). Different settings influence different roles, behavior, and interactions within an individual (Bronfenbrenner, 1979). Bronfenbrenner differentiates his theory from the disciplines of sociology and anthropology due to the specific focus on development, or “development-in-context” (Bronfenbrenner, 1979, p. 12). While Bronfenbrenner often conceptualizes the child as the individual, for the purpose of this study, the father will be considered the individual. Using the father as the individual, these five systems are illustrated in Figure 1. Relationships can exist within and between systems; no system is static (Bronfenbrenner, 1979).

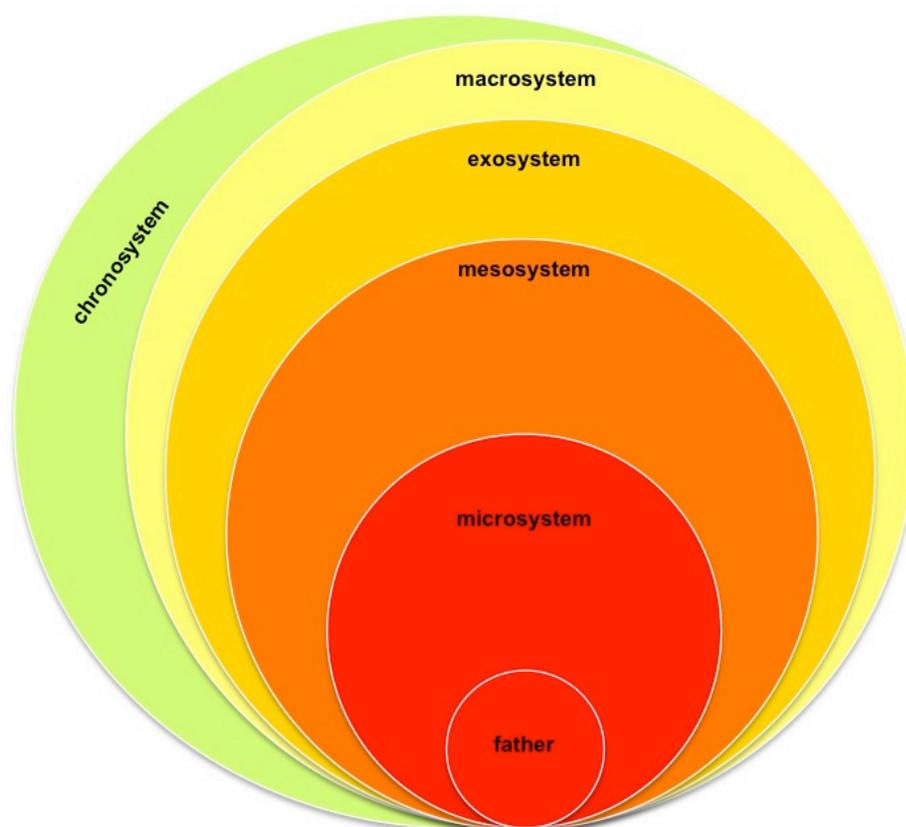


Figure 1: Bronfenbrenner's ecological systems theory (1979) with father at the center

Microsystem. The microsystem is the individual's immediate environment, activities, roles and experiences. Bronfenbrenner (1979) stresses that objective reality is not as important as the perceived experience. For the focus of this study, the NICU environment and the role of father are examples found in the father's microsystem.

Mesosystem. The mesosystem is comprised of the relationship between microsystems. For the individual, these must be systems in which he is an active participant. For example, the mesosystem could include the co-parent relationship. As the father moves into the new setting of the NICU, this changes his mesosystem. The mother also changes her mesosystem. This is a dual transition, which Bronfenbrenner hypothesizes is more beneficial for an individual's "developmental potential" than transitioning alone (1979, p. 211). However, if the demands on the individual in two mesosystems are not compatible, this results in conflict (Bronfenbrenner, 1979). The conflict may manifest in the father's struggle to find a balance between returning to work and being present in the NICU. Similarly, the co-parent relationship may also be affected by this transition.

Bronfenbrenner also stresses the importance of direct and indirect communication between settings; this is not only a tenet of family-centered care, but also a common theme found in the literature regarding fathers' experiences in the NICU. Bronfenbrenner proposes that if an individual is informed about the setting prior to the transition, there are better outcomes for the individual. This aligns with the recommendation that fathers would benefit from more inclusion and participation in prenatal care. It may not be possible to prepare parents for the NICU in advance; the unexpected nature of admittance to the NICU is one aspect of the stressful and often traumatic environment.

Exosystem. Bronfenbrenner believed that researchers often ignored the role of environments that an individual could be influenced by, even if the individual is not an active member of the group or organization, such as legislative bodies or neighborhood associations (Bronfenbrenner, 1979, p. 18). The exosystem are those settings that influence the individual without his direct participation and vice versa. An example of this system for the father in the NICU includes the hospital administration; the decisions made by the administration regarding hospital policies would have an impact on the father, even though he has no part in making policy decisions.

Macrosystem. The macrosystem takes the widest view of the environment, accounting for societal and cultural norms and expectations. Bronfenbrenner (1979) includes “intrasocietal contrasts” in the macrosystem, such as different social classes and subcultures (p. 26). The macrosystem also represents consistencies between the micro-, meso- and exosystems (Bronfenbrenner, 1979). For a father in the NICU, the macrosystem would include cultural expectations for the role of fatherhood.

Chronosystem. The chronosystem accounts for the effect of time on the other systems (Bronfenbrenner, 1986). For this model, it will include factors that influenced the father before the infant’s birth. For example, how the father was parented as a child will likely influence how he parents his infant.

An ecological transition is defined as “change in an individual’s role, setting, or both” (Bronfenbrenner, 1979, p. 26) that affects the individual’s relationship with his environment and his development. Becoming a parent is an ecological transition; doing so in the NICU would also change the father’s “position in the ecological environment” (Bronfenbrenner, 1979, p. 26).

As an individual develops, he becomes more aware of each ecological system and increases his ability to bring about changes to those systems.

Developmental validity. Bronfenbrenner proposes that development only truly occurs when an individual is able to transfer skills or behaviors from one setting to another, also known as skill generalizability (1979). This aligns with patient- and family-centered care in music therapy. By extending the focus to the family, the family is able to transfer skills learned in music therapy across settings, from the NICU to the home environment.

Importance of dyads. In his seminal work *Ecology of Human Development* (1979), Bronfenbrenner emphasizes the importance of the dyad, an aspect also important in attachment theory. He proposes two individuals form a dyad first by attending to one another. This could lead to mutual, reciprocal participation in an activity and have a positive emotional impact for both parties. Shifts in power could also occur, with one party relinquishing power to gradually increase the power of the other person. Therefore, the dyad engages in increasingly complex interactions. The experience of parent-infant attachment is parallel to these propositions. Through consistent caregiving, the infant learns that her actions have meaning and power. In his research, Bronfenbrenner (1979) states the importance of using measurements that assess both parties, not simply the infant or the caregiver. Attachment research has also been criticized for failing to assess both members of the dyad. For premature infants, this poses a problem: how can attachment be measured when an infant is not yet developmentally able to engage in the typical reciprocal parent-infant interactions, such as eye gaze or vocalizations? Perhaps one solution is to measure the infant's physiological stability (i.e., maintaining homeostasis or becoming over-stimulated) during and after parent interactions. By measuring parents' ability to read and respond to these subtle cues, this may also shed light on the parent-infant relationship.

Bronfenbrenner proposes “if one member of the dyad undergoes a developmental change, the other is also likely to do so” (Bronfenbrenner, 1979, p. 65). This may explain the salience of the couple relationship for fathers. The “reciprocal development” (p. 65) may also account for the influence of the mother’s experience with the infant impacting the father’s view of his parental self-efficacy. The mother-infant dyad may develop together in a way that leaves the father feeling less effective when interacting with the infant. This may lead the father back to the workplace where he feels more capable. Similarly, Bronfenbrenner also notes the importance of taking into account all the relationships that may affect one member of the dyad. For the father-infant dyad in the NICU setting, this includes relationships with the medical staff, the music therapist and the father’s partner.

Ecological systems theory provides a formal theory to identify and describe the complex variables of the father’s attachment relationship with his premature infant in the NICU. Due to the interwoven experiences of the father and mother in the NICU, as well as the outside forces at play that influence fatherhood in general, ecological systems theory begins to clarify the experience of fathers in the NICU. However, it does not explain how a music therapy intervention might increase secure father-infant attachment. A framework that allows for exploration of all of these variables and their relationships is needed.

Causal Modeling

Causal thinking is one of the common ways that social scientists understand and explain phenomena; even if true causation is never proven, causal modeling helps scientists understand change (Jaccard & Jacoby, 2010). When used as a method of statistical analysis it is referred to as structural equation modeling (SEM) (Jaccard & Jacoby, 2010). Causal modeling explains what causes variability on a specific construct by analyzing the relationships between variables

(Jaccard & Jacoby, 2010). For this study, a theoretical causal model was created using evidence from the research literature. In addition, the constructs explored from ecological systems theory were integrated into the model.

The model that was developed is intended to be a comprehensive look at the fathers' experiences bonding with their premature infants in the NICU. Due to the complexity of this experience, it is a complex model. Blalock (1991) argues that all causal models, whether for experimental research or not, must include untested assumptions that are made clear to the reader, thereby increasing the complexity of the model. The conceptual framework developed for this study includes information gathered from qualitative and quantitative research. Therefore, it likely includes untested relationships between variables. The model was not tested for this study, but intended to provide plausible causal pathways for a music-based intervention to increase bonding for fathers and their premature infants in the NICU. The model is not driven by empirical evidence due to the lack of information for many of these variables. It will still be a valuable way to consider pathways for intervention, the mechanisms of change, and to understand the existing gaps in research literature. Ultimately, the conceptual framework is a series of theoretical propositions that informs future empirical research.

Outcome variable. One method of theory development recommended by Jaccard and Jacoby (2010) is to start with the outcome variable; in this case, a secure father-infant attachment. The “cause” of this outcome is the intervention, music-based bonding for fathers and premature infants in the NICU. It is important to include both infants and fathers in the construct of attachment. As discussed previously, for premature infants and fathers, attachment behaviors may look differently from those of a typically developing infant and father dyad.

Examples of the outcome behaviors include the fathers' ability to read their infant's cues, and the infant's physiological state to indicate overstimulation or homeostasis.

Mediators. A mediator is a variable that explains why an outcome occurs (Jaccard & Jacoby, 2010). This third variable connects the cause to the effect as an indirect or an intervening variable (Wu & Zumbo, 2008). The cause, in this case the music-based bonding intervention, must first change the mediator, parental self-efficacy, which in turn will change the outcome, father-infant attachment. Mediators are often a changeable state (Wu & Zumbo, 2008). In order for an intervention to be effective, mediators need to be accounted for in the intervention design.

Moderators. A moderator explains why some individuals would be more likely to achieve the outcome than others; it changes the strength of the relationship between the intervention and outcome (Jaccard & Jacoby, 2010). A moderator would answer for whom and when the intervention would have the largest or weakest effect (Wu & Zumbo, 2008). Looking at the literature reviewed, there are many moderators that may be at play, such as the father's prenatal attachment. If a father has a stronger prenatal attachment, he is more likely to have a stronger postnatal attachment. Moderators are often a stable trait, less likely to be changed (Wu & Zumbo, 2008). The intervention for this model did not target prenatal attachment, but it was considered for its impact on the outcome variable.

Moderated moderators, moderated mediators, and mediated moderators.

Moderator and mediator variables, as described above, have effects on the relationship between the cause and the outcome. Beyond the cause and the outcome, moderators and mediators can also have relationships with each other. This results in at least four variables, because all mediators and moderators are parts of causal relationships (Wu & Zumbo, 2008). A moderator

variable can be moderated. This means, another variable (the fourth variable, a moderator) would account for the strength of the moderator. An example of this is a father's adult attachment. A father's attachment with his parents will impact his prenatal attachment. Prenatal attachment is considered a moderated moderator.

Moderators can also moderate mediators. The mediation effect would depend on the level of the moderator (Wu & Zumbo, 2008). An example for this model is the father's role and his parental self-efficacy. The father's view of role, which includes his participation in care, would moderate the relationship between the intervention and his parental self-efficacy. Parental self-efficacy would therefore be a moderated mediator.

A moderator can also be mediated. In this case, the mediator has a secondary role to explain the presence of the moderator (Wu & Zumbo, 2008). For example, a father's demands from his workplace would partially mediate his ability to be physically present in the NICU. His presence in the NICU moderates the effect of the intervention. Therefore, time spent in the NICU is a mediated moderator.

Reciprocal relationships. Attachment theory stresses the importance of the dyad and the reciprocal relationship between the infant and caregiver. Therefore, it may be necessary to include a reciprocal relationship in this conceptual framework. Jaccard and Jacoby (2010) acknowledge the implicit time variable in a reciprocal relationship, noting that a simultaneous reciprocal relationship does not exist (p. 153). Reciprocal relationships may be simply that X causes Y and in return Y causes X; like other variables, a reciprocal relationship can also be mediated or moderated (Jaccard & Jacoby, 2010).

Theoretical synthesis. The conceptual framework integrates ideas from ecological systems theory and causal modeling. Using ecological systems theory to discern where variables

are nested can help illuminate their relationships with the outcome, mediator and moderator variables. The final synthesis was an iterative process that used evidence from the extant literature. A causal model is illustrated that represents the mediating and moderating variables that need to be considered when designing an intervention to increase secure father-infant attachment for fathers with premature infants in the NICU.

Researcher's Frame

Theoretical research is shaped by the researcher's culture, experiences and viewpoints. For transparency, the researcher will explore these in more detail in first person voice. The information I provide is adapted from recommendations made by Aigen (2005).

Experiences, beliefs and motivations that have shaped this research. I have been interested in the NICU since my undergraduate coursework at the College of Wooster in Wooster, Ohio. My internship and professional clinical experience included work with a variety of young children, including typically developing and at-risk children. I have always felt most effective and most energized as a music therapist working with these populations. Addressing pre-literacy skills with children from Head Start preschools, I wondered how lasting the effects of music therapy were without involving the family. During graduate school, my interest in early intervention expanded to include the youngest of all populations, infants and preterm infants in the NICU. I am completing an advanced practicum in the NICU.

I was drawn to attachment theory during a music and infants class in graduate school; the theory began to answer some of my questions from my clinical work. I was also drawn to attachment theory through the lens of adoption. My interest soon grew to other populations that have barriers to forming secure attachments, including the NICU population.

As I began this study, I first focused on mothers' experiences in the NICU. My focus soon shifted to fathers due to a clear gap in the literature. I was initially disappointed to not be writing about mothers' experiences because I believe in the importance of mother-infant attachment. However, learning about fathers' experiences made me realize that examining fathers as caregivers was a feminist issue. By limiting mothers to the role of caregivers, it also limits fathers to the role of providers. I believe that many fathers do not want to be limited to this role exclusively.

I also realized that by looking at fathers, this opens up implications for gay and transgender parents. These parents also lack a voice in the research literature. When the mother-infant relationship is viewed as the most important attachment relationship, it excludes non-female parents. Further, by looking critically at infants' preference for the female voice, this opens the path for parents and music therapists of all genders to work with infants. The music therapy profession can accept transgender therapists and clients by looking beyond the dichotomous view of gender often found in research. The way parents are labeled as mother or father explicitly denotes gender and, when one label is paired with the other, indicates sexuality. More research is needed in this area. However, it is unclear whether the NICU is the right setting for this research at this time. I chose to focus on fathers in the NICU knowing that this is a label for male parents. I believe that this is a step towards expanding the view of gender with regards to parenting and infant-directed singing.

Researcher's cultural background and group membership. I am white, married and female; I am middle class. I am currently a graduate teaching assistant and a practicing board certified music therapist. I recognize that my ability to attend school and work part-time is a benefit of my economic privilege. My mother and father are married. My father's work at

Goodwill Industries®, a non-profit organization that empowers persons with disabilities to find employment, is one driving factor for why I chose to study music therapy.

Music is valued in my family. My maternal grandmother is a pianist. My sister took piano lessons, played the flute and French horn, and is a talented singer. My mother now takes piano lessons, and took lessons when she was young. My father sang in choir when he was in high school. I was eager to start piano lessons due to these influences. I believe that music has value and that it can be experienced as a family, as well as individually. Music is an important interest for my husband and his family as well. As a music therapist and musician, I personally value music, not only for its application within a therapeutic arena, but also as an aesthetic experience.

Potential biases. I acknowledge how my privilege may affect my interpretation of the research literature. The literature itself on fatherhood is biased because it is limited in scope. In addition, it is under-representative of fathers of color, unmarried fathers, fathers that are not heterosexual, and fathers with lower socioeconomic status. As a feminist, I must be aware of any biases when interpreting research that compares mothers and fathers.

Effects of research on the researcher. After beginning this research, I realized that I also have a personal history of music with my father. We have always shared singing along to the radio, memories he mentioned in the toast at the rehearsal dinner at my wedding. I also have distinct memories of my father singing to me, at my request, to help me fall asleep (“Dream” by Everly Brothers and “Yesterday” by the Beatles) and singing the lap bounce “Pony Boy” with the word “girl” substituted for “boy.” Interestingly, my maternal grandmother never sang, which baffled me as a child. I do not remember the specific songs my mother sang to me, although I know she did sing and would lead music at the at-home daycare she ran when I was young.

Chapter 4

Results

Premature birth has long-term effects on an infant's development (Centers for Disease Control and Prevention, 2015). Admittance to the NICU is stressful for both the infant and the parents. In this environment, parents may have barriers to bonding with their infant, making it more difficult to form a secure infant-caregiver attachment (Johnson, 2008). Parents may be experiencing symptoms of trauma or grief associated with a preterm birth. The experience of unresolved grief may make it more difficult to bond with their baby (Shah, Clements & Poehlmann, 2011). The quality of attachment between an infant-caregiver can be predictive of future psychopathology or can act as a protective factor (Zeanah & Smyke, 2009). Research is emerging regarding the father's distinct role and experience of becoming a parent in the NICU, but no published music therapy literature has focused specifically on fathers and their bonding and attachment with their premature infants in the NICU. Attachment theorists are beginning to call for more complex models that incorporate other theoretical frameworks to understand father-child attachment (Palm, 2014).

The iterative review of literature and the theoretical framework of ecological systems theory and causal modeling were used to identify the key constructs relevant to the father's unique experience in this setting. This chapter defines these constructs and the relationships among each another. Lastly, the theory-based conceptual framework for a music therapy intervention to support secure father-infant attachment and bonding with a premature infant hospitalized in the NICU is illustrated.

Identifying & Defining Constructs

The first task for constructing theory is to identify and define the various constructs that become salient in the literature review (Jaccard & Jacoby, 2010). The constructs are defined and placed into the ecological system theory framework, starting with the individual and working outward, to include the microsystem, mesosystem, exosystem, macrosystem and the chronosystem. The ecological systems for fathers in the NICU are illustrated in Figure 2.

Constructs that are in gray text do not appear in the final causal model.

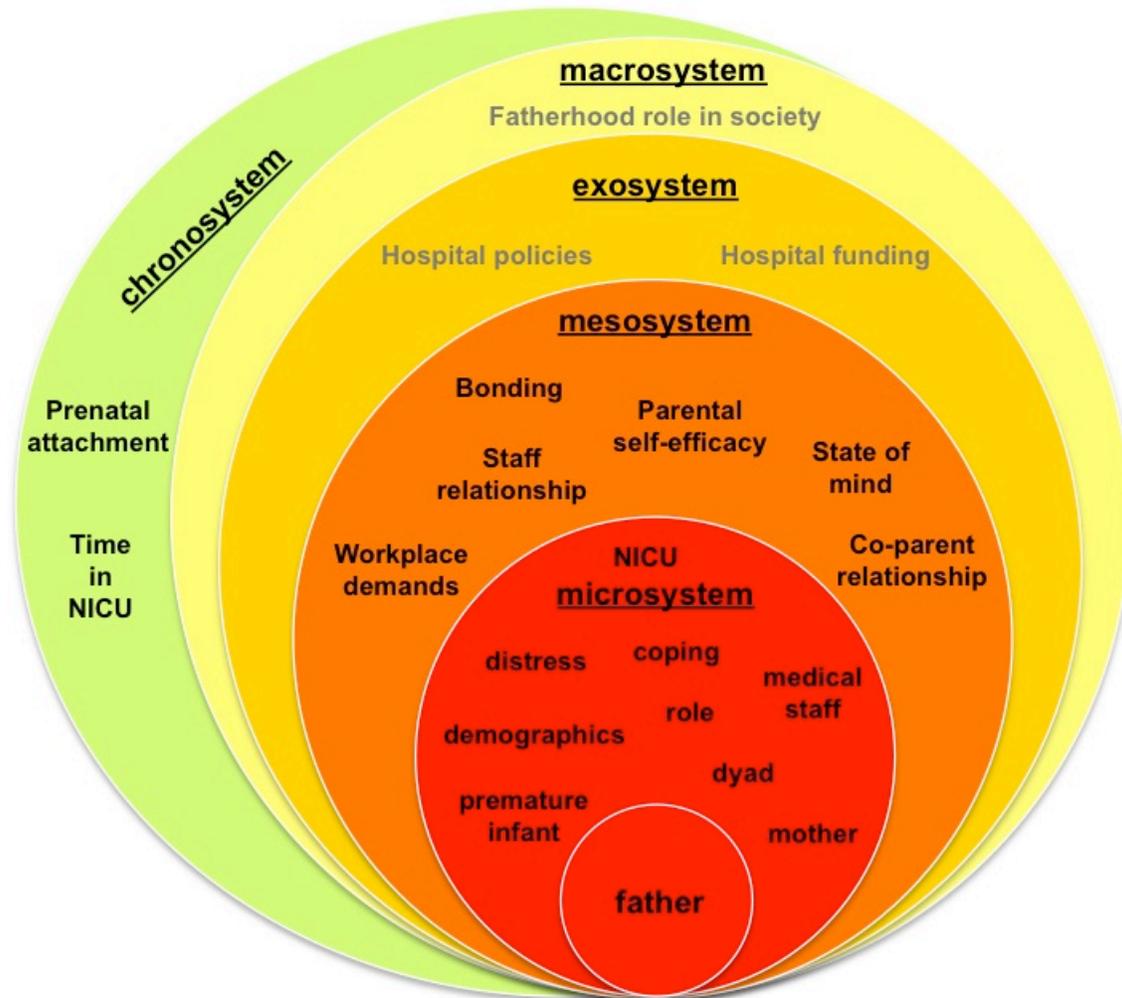


Figure 2: Ecological systems for fathers in the NICU

The individual in ecological systems theory. Bronfenbrenner's (1979) theory is a developmental theory that places the infant or child at the center of the nested systems. In this case, due to the need to further understand and acknowledge the unique variables related to fatherhood in the NICU, the father is considered the individual. However, it will be the father-infant dyad that receives the music therapy intervention.

Father. For this study, a father is defined as a parent of the male gender. Note that the definition does not indicate sexuality or biological sex. This includes fathers of any sexuality and does not indicate marital or relationship status. The definition also includes transgender men. It does not include parents that are not of the male gender and does not specify the parent's biological sex. Parents that are gender neutral, non-binary, and/or gender queer should have increased representation within the research literature; however, that is not within the scope of this project. This choice of male gender has been made due to societal expectations for fathers and the influence of the male gender role on fatherhood. All of the studies reviewed did not indicate the inclusion of fathers who are transgender men.

This definition is also inclusive of adoptive fathers. Little research has explored adoption in the NICU. Adoptive parents often face challenges that are different than biological parents (McAlpin, 2013; Juffer, Hoksbergen, Riksen-Walraven, & Kohnstamm, 1997). While adoption is often a successful experience for both parents and children, adopted children are at a higher risk for developing insecure or disorganized attachments (van der Voort, et al., 2014), which can be predictive of future psychopathology (Zeanah & Smyke, 2009). However, due to the scope of this project, adoption was not included in the model.

Constructs identified and defined in the microsystem. Many of the constructs identified in the extant literature occur at the microsystem level. The microsystem is the

individual's relationships, roles and experiences within his immediate environment. The immediate environment in the model is the NICU, which is where the intervention would occur.

Premature Infant. A premature infant is an infant born before 37 weeks gestational age (Kaneshiro, 2014). Premature infants have diverse health needs. Infant health will be accounted for in this framework. An infant will need to be medically stable enough to receive a music therapy intervention, and the music therapy literature recommends intervention starting at 28 weeks gestational age at the earliest (Hanson-Abromeit, 2003; Standley, 2012). This definition also includes infants of both sexes. Infant sex is accounted for in the conceptual framework due to the influence on the father's ID singing, specifically an increased playfulness with male infants and a more soothing style for female infants (Trehub, Hill & Kamenetsky, 1997). Other infant characteristics such as temperament (McBride, Schoppe, & Rane, 2002) and birth order are also considered.

Father-infant dyad. Attachment theory and ecological systems theory both acknowledge the importance of the dyad. The dyad includes the father and his premature infant. Two individuals form a dyad by attending to one another (Bronfenbrenner, 1979). Both the father and the premature infant will be the recipients of the music therapy intervention in this conceptual framework. Aligning with Bronfenbrenner's (1979) recommendations, behaviors of both parties will be taken into account.

Fatherhood role. The construct of roles is experienced and acted on at the microsystem level. Bronfenbrenner defines role as "a set of activities and relations expected of a person occupying a particular position in society, and of others in relation to that person" (1979, p. 85). This is not a linear relationship, but instead describes the way a person is expected to act and how others are expected to act towards the individual. While this influences the individual in the

microsystem, the foundations of the role come from the macrosystem (Bronfenbrenner, 1979). Bronfenbrenner goes on to indicate the following relationship: how an individual treats another person is not only dependent on the other person's role, but also the individual's role within society. As a person goes through development, he is exposed to an increasing amount and complexity of roles and, at the same time, develops an increasing amount and complexity of roles for himself, or "an ever-broadening role repertoire" (Bronfenbrenner, 1979, p. 104).

The fatherhood role is the societal expectations for a father within a specific culture or subculture. This would also include the degree to which a father conforms to or diverges from these expectations. In the NICU setting, the ways a father interacts with his infant, partner and the medical staff would be influenced by his role as a father. Likewise, his fatherhood role would influence how these same individuals interact with him, with the exception of the infant. How a father sees himself compared to the mother seems to have a relationship with the type of interactions the father has with his infant, and his motivations to participate in these interactions (Feeley et al., 2013). For this framework, the father's role in the NICU is defined as how the father thinks about and is motivated to participate in his infant's care. This is synonymous with the father's level of involvement in the NICU.

Being actively involved with care includes direct caregiving behaviors, such as changing an infant's diaper, kangaroo care and interacting with the infant. This would also include singing to the infant. The father may also participate in indirect caregiving behaviors, such as running errands or taking care of siblings outside of the NICU. Active involvement has a stronger relationship with positive parenting and child outcomes (Sarkadi, Kristiansson, Oberklaid, & Bremberg, 2008).

The medical staff. The staff in the NICU includes nurses, doctors, occupational therapists, speech language pathologists, social workers, the spiritual care team, and any other medical or psychosocial professionals that may be working in the NICU. This would also include the music therapist. In the literature reviewed, nurses are the most represented.

Mother. Similar to the definition for father, the infant's mother is a parent of the female gender. This definition does not indicate the relationship status of the mother and father. Surrogacy and adoption occur in the NICU, but are not the focus of this study. The mother-father relationship is explored further in the mesosystem.

Distress. Parents of infants born prematurely experience a range of emotions including stress, anxiety, depression, grief and symptoms of trauma. Distress is defined as “a negative emotional state in which the specific quality of the emotion is unspecified or unidentifiable” (VandenBos, 2015, p. 326). This is distinct from pre-existing symptomology or mental health diagnosis before the infant's birth. Mothers and fathers of preterm infants are more likely to have post-traumatic stress disorder (PTSD) symptomology when compared to parents of full-term infants (Ghorbani, Dolatian, Shams, Alavi-Majd & Tavakolian, 2014). Fathers of preterm infants have less symptomology when compared to mothers of preterm infants (Ghorbani et al., 2014). A parent's emotional state has an impact on his ability to participate in caregiving behaviors (Franck, Oulton and Bruce, 2011). Maternal emotional distress is associated with lower infant outcomes (Holditch-Davis, Schwartz, Black & Sher, 2007). Therefore, coping with the trauma of a preterm birth and admittance to the NICU may ultimately impact the father-infant relationship.

Coping strategies. A coping strategy is defined as “an action, a series of actions or a thought process used in meeting a stressful or unpleasant situation or in modifying one's

reactions to such a situation” (VandenBos, 2015, pp. 252-253). This does not include unintentional or subconscious psychological defenses (VandenBos, 2015). Coping strategies can be adaptive or maladaptive. Coping strategy(ies) is synonymous with coping skill(s).

Family demographics. The demographic information includes the parents’ marital status, the annual family income, family members’ race and culture and the number of family members. This would also include the father’s mental health. It is important to understand the influence of these factors on other variables in the model and their impact on the intervention.

Constructs identified and defined in the mesosystem. The mesosystem is comprised of relationships between microsystems (Bronfenbrenner, 1979). The father is an active participant in the constructs identified below.

Quality of the co-parent relationship. The co-parent relationship is defined for this study as the relationship between the mother and father. It does not indicate the relationship status or either individual’s sexuality. Parents may be a couple or not, living together or apart, married or not. Exploring fatherhood may have implications for gay parents who would benefit from more representation in research literature. However, due to the scope of this study, the focus is on the mother and the father.

The quality of the relationship may have a positive or negative impact on a variety of other constructs, including the father’s feeling of being involved with the pregnancy and in future childcare (Genesoni & Tallandini, 2009; Slade et al., 2009), the father’s view of his role and involvement (Genesoni & Tallandini, 2009), paternal post-partum depression (Musser et al., 2013; Singley & Edwards, 2015), and post-traumatic stress symptoms (Musser et al., 2013; Singley & Edwards, 2015). Many of the co-parent relationships explored in the review of literature focused on couples that were either living together or married.

Workplace demands. The father's role at work will likely impact the time he is able to spend in the NICU and is accounted for in the model. Fathers often go back to work after an infant is born and cite economic reasons as a barrier to their presence in the NICU (Lantz, 2013). Often fathers consider themselves as providers for the family (Jackson et al., 2003). However, workplace demands only partially explain how much time a father can or cannot spend in the NICU (Feeley et al., 2013).

Staff relationship. The relationship between staff and parents has a strong influence on the parents' experience in the NICU. This relationship includes the communication between the medical staff and the father. While both parents value information and communication from the NICU staff, research indicates that fathers may have different communication needs (Sisson et al., 2015). Fathers value direct and clear communication more so than mothers (Jones, Woodhouse, & Rowe, 2007). The NICU staff often promotes parental involvement, a foundational element of patient- and family-centered care (Feeley et al., 2013; Gooding, et al., 2011). Staff also likely influence fathers' parental self-efficacy.

Parental self-efficacy. Self-efficacy as proposed by Bandura (1986) is defined as a person's judgment of his ability to accomplish tasks or perform a set of actions. A person's level of performance of a task is determined not only by his skill level but also by his self-efficacy. Self-efficacy is formed based on an individual's mastery of a skill, his physiological state during the performance of the skill and by observing or talking to others (Bandura, 1986). This is distinct from an individual's self-concept or his self-esteem (Bandura, 1986).

Parental self-efficacy (PSE) is defined as an individual's belief that he will be a competent parent and successful at parenting tasks (Murdock, 2013). This aligns with the literature that suggests fathers often master a parenting skill to cope with the stress associated

with becoming a new parent (Genesoni & Tallandini, 2009). As indicated by Bandura (1986), an individual's self-efficacy can be influenced by others. Both the co-parent relationship and the interactions with the NICU staff may influence the father's parental self-efficacy.

The mother can act as gatekeeper for the father (Genesoni & Tallandini, 2009). Likewise, the mother's views of the father's role and parental capabilities can influence the father's behavior (Genesoni & Tallandini, 2009; Tremblay & Pierce, 2011). Due to the involvement of a medical staff of "experts," parents may take a passive role in the care of their infant (Reis, Rempel, Scott, Brady-Fryer, & Van Aerde, 2010). However, nurses often model optimal caregiving behaviors and also verbally encourage parents to participate in their infant's care. Both of these actions can influence parental self-efficacy and align with Bandura's (1986) view of self-efficacy. Parental self-efficacy impacts parenting behaviors (Bandura, 1986).

Parenting an infant with high medical needs and more barriers to typical parent-infant interactions may put parents at risk for lower parental self-efficacy. Premature infants may be less responsive to parenting interactions (Holditch-Davis, Cox, Miles & Belyea, 2003). This may continue to affect interaction after the infant goes home from the hospital. After discharge, mothers of premature infants had less optimal interactions in comparison to mothers of full-term infants (Harrison & Magill-Evans, 1996). Likewise, fathers of premature infants had less optimal interactions than fathers of full-term infants (Harrison & Magill-Evans, 1996). The greatest differences found in interaction styles between mothers of full-term infants and premature infants is during the first six months after birth (Korja, Latva, & Lehtonen, 2012). Addressing parental self-efficacy during the hospital stay may be one way to help parents increase their optimal parenting skills in the hospital and maintain those skills after discharge.

Bonding. Bonding is defined as the father's process of forming an attachment with his infant (VandenBos, 2015, p. 138). A father's bonding can be acted on outwardly through caregiving behaviors. This construct is placed in the mesosystem because it represents the interaction between the father and infant. Optimal caregiving behaviors are those behaviors that promote a secure father-infant attachment. The literature identifies a variety of behaviors, including warmth, sensitivity, synchrony, responsiveness, and attunement. The father's thoughts and feeling about his infant are also an important aspect of bonding. Therefore, bonding is an external and internal process. Bonding is distinct from attachment; attachment encompasses the relationship between father and infant that continually develops through infancy into toddlerhood (Beckett & Taylor, 2010). Instead, bonding is solely the responsibility of the father. It represents his interactions with and thoughts regarding his infant.

State of mind. State of mind is an adult's inner working model of his own attachment to his caregivers (Condon et al., 2013). This represents the father's views on parenting, based on his perceptions of being parented. State of mind can be assessed through the Adult Attachment Interview (AAI), which aligns with the attachment categories proposed with Ainsworth's strange situation procedure (SSP) (Van IJzendoorn, 1995). State of mind is associated with parenting behaviors and is predictive of caregiver-infant attachment (Van IJzendoorn, 1995). However, it is less predictive of attachment for fathers than for mothers (Van IJzendoorn, 1995). This construct is placed in the mesosystem because it represents the relationship between the father's new and old roles: the father's current role as father and his past role as child.

Considerations for the exosystem and macrosystem. These systems are less explored in the extant literature. The exosystem would include hospital policies, including patient- and family-centered care (PFCC), hospital funding, and many more variables. In the causal model,

these are not accounted for because the intervention is not targeting systemic changes. Future intervention research, especially for multi-site studies, may find that some of these variables have an effect on the outcome of the intervention.

The macrosystem influences the role of the father in the NICU, a construct that has been defined at the microsystem level. This includes social expectations, such as the father is the provider (Jackson, et al., 2003), and is strong despite the circumstances (Sisson et al., 2015). It also includes the lack of role models for involved fatherhood (Genesoni & Tallandini, 2009). The macrosystem is not the same for every individual father, although it may share many similarities. Likewise, the conceptual framework has been developed within the wider context of Western medicine and culture, supported by research written in English, mostly from Western cultures.

Constructs identified and defined in the chronosystem. The chronosystem accounts for the passage of time. Therefore, these constructs are related to the infant or father's time in the NICU or constructs that occur before the point of intervention.

Time spent in the NICU. This is the quantity of time a father spends in the NICU. This includes the number of visits and the length of visits made by the father. It is separate from the type of behaviors (e.g. quality of time) the father is engaged in during his time spent in the NICU.

Prenatal attachment. Prenatal attachment is an attachment that the father develops for the fetus, or the father's thoughts and feelings about his future baby (Condon et al., 2013). A strong prenatal attachment is a predictor for father-infant attachment (Condon et al., 2013) and is accounted for in the model. This is placed in the chronosystem because it occurs before the point of intervention.

Using Causal Modeling To Explore Change

Causal modeling is used to explore the relationships among the above constructs and to understand what needs to be taken into account when designing an intervention for a father-infant dyad.

Outcome variable. A secure attachment is developed through consistent caregiving. However, attachment is learned and develops over time. A secure attachment is not fully formed until later in infancy. Therefore, it is imperative that the music therapy intervention target parent bonding, which includes optimal parenting behaviors, a short-term outcome that will lead to a secure-attachment (Schechter & Willheim, 2009). Optimal parenting behaviors, such as responsiveness and sensitivity, can help an infant maintain physiological homeostasis. When a parent is sensitive to his infant's cues, he will not over-stimulate the infant. Therefore, infant outcomes are included. This also aligns with attachment theory and ecological systems theory because these short-term outcomes, parent and infant behaviors, have a reciprocal relationship with one another.

Moderators. There are many moderating variables drawn from the extant literature. These include the father's prenatal attachment, the father's state of mind, the infant's characteristics, and the family demographics. The relationship with the staff as well as the co-parent relationship influences the father's behavior in the NICU. The father's workplace demands would also influence the father's amount of time in the NICU. Lastly, how the father views his role, in the NICU and more broadly as a father, is a moderating effect for the intervention.

Mediators. The mediating variables have an indirect relationship between the intervention and the outcome variables. These variables explain why an outcome is achieved.

How a father copes with the distress associated with the NICU environment would partially explain his ability to bond with this infant. A father's parental self-efficacy partially explains his optimal parenting behaviors. Parental self-efficacy is often used as a mediator in experimental models (Guimond, Wilcox, & Lamorey, 2008).

Confidence in voice. The final mediator added to the model is the father's confidence in using his voice (speaking, whispering, humming and/or singing) to interact with his infant. This variable is not included in the ecological systems framework due to its relationship with the music-based intervention. Confidence in voice is drawn from Shoemark and Arnup's (2014) survey of mother's thoughts and use of their voices in the NICU. The study found that embarrassment, not knowing what to sing or not being able to sing were reasons some mothers gave for not singing to their infant in the NICU (Shoemark & Arnup, 2014). Other reasons for not singing may also be due to context; while singing to an infant is a natural caregiving behavior, the unnatural setting of the NICU may impact this behavior (Shoemark & Arnup). Likewise, the father's level of confidence using his voice would impact the outcomes of a music-based intervention.

Intervention. The music intervention is infant-directed (ID) singing by the father, coached by the music therapist. This would be adapted from the theory-based framework for ID singing as a music therapy intervention (de l'Etoile, 2006b). Fathers use ID singing differently than mothers, but still show emotional expression that is identifiable by adult listeners (Trehub, Unyk et al., 1997). More research is needed to understand how infants respond to ID singing by fathers and how the differences in musical elements might affect infant outcomes.

The Conceptual Framework for a Music-Based Bonding Intervention

The conceptual framework for a music-based bonding intervention for fathers with premature infants in the NICU is illustrated in Figure 3. The color of each construct aligns with the placement in the ecological systems framework presented in Figure 2. The intervention and the father's confidence in his voice are not represented in the ecological systems theory framework and are colored blue in this model. The outcome variables are represented at the mesosystem level, characterized by relationships between microsystems. The majority of mediators also come from the mesosystem. The moderating variables are more diverse and almost equally representative of the micro-, meso- and chronosystems. The citations associated with the constructs in the framework are listed in Table 1.

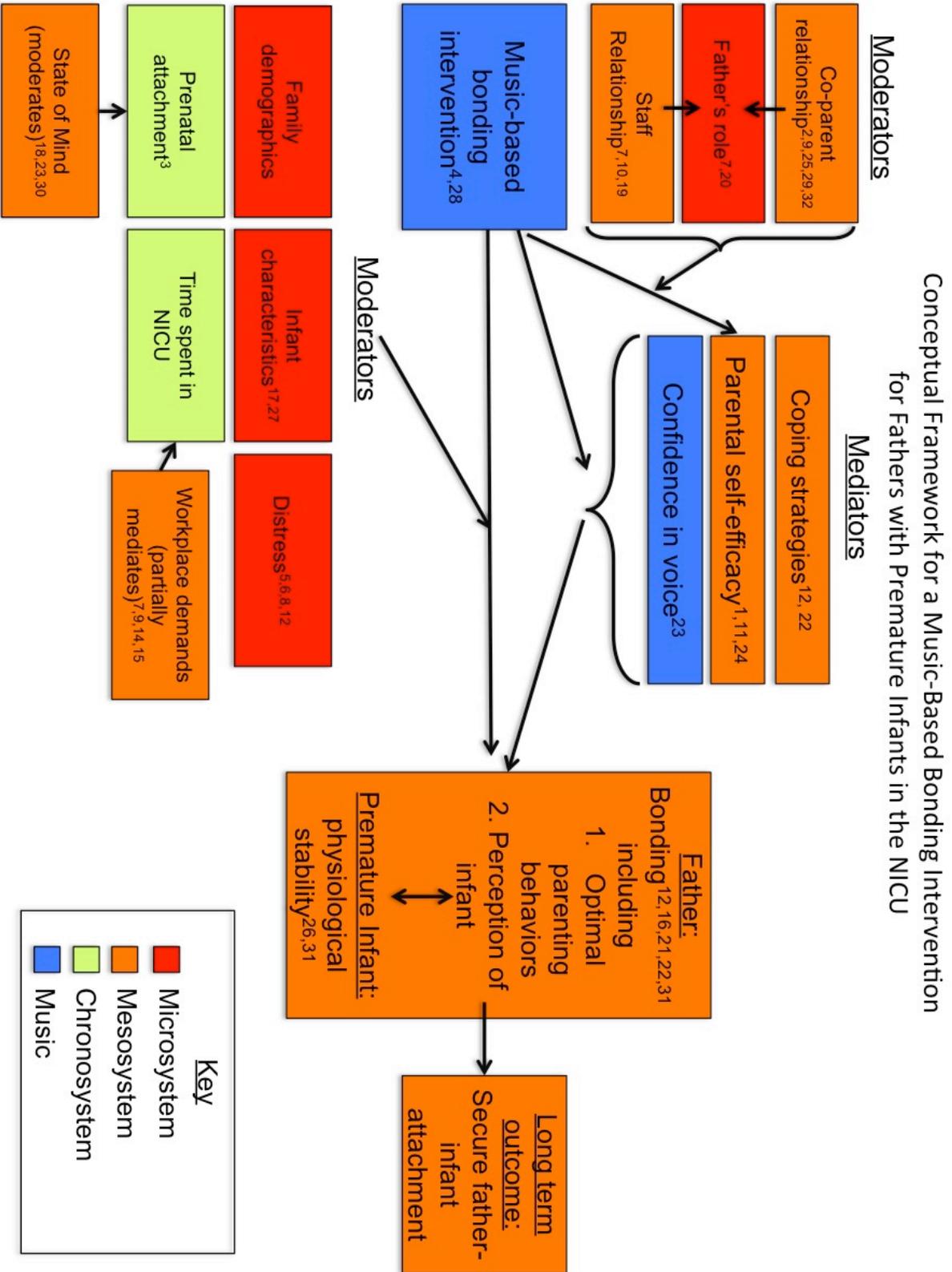


Figure 3: Conceptual framework for a music-based bonding intervention for fathers with premature infants in the NICU

Table 1: References for the conceptual framework

1	Bandera, 1986
2	Binder et al., 2011
3	Condon et al., 2013
4	de l'Etoile, 2006b
5	Elmir et al., 2010
6	Elmir & Schmied, 2016
7	Feeley et al., 2013
8	Franck, Oulton and Bruce, 2011
9	Genesoni & Tallandini, 2009
10	Gooding, et al., 2011
11	Guimond, Wilcox, & Lamorey, 2008
12	Hoffenkamp, et al., 2015
13	Holditch-Davis et al., 2007
14	Jackson et al., 2003
15	Lantz, 2013
16	Lucassen et al., 2011
17	McBride, Schoppe, & Rane, 2002
18	Palm, 2014
19	Reis, et al., 2010
20	Sarkadi et al., 2008
21	Schechter & Willheim, 2009
22	Shaw, Bernard, Storfer-Isser, Rhine, & Horwitz, 2013
23	Shoemark & Arnup, 2014
24	Sisson et al., 2015
25	Slade et al., 2009
26	Standley, 2012
27	Trehub, Hill & Kamenetsky, 1997
28	Trehub, Unyk et al., 1997
29	Tremblay & Pierce, 2011
30	Van IJzendoorn, 1995
31	Whipple, 2000
32	Yu et al., 2012

Relationships in the conceptual framework. The placement and the relationships in the model represent theoretical position statements. Some of these statements are well supported in the literature while others are not well represented in the extant literature and thus are hypotheses. The positions represented in the conceptual framework are as follows:

1. A music-based intervention can influence parental bonding and promote infant physiological stability
2. Parent and infant outcomes have a reciprocal relationship
3. Short-term, optimal parenting behaviors have a long-term effect on father-infant attachment.
4. The intervention is mediated by the following: the father's coping strategies, his parental self-efficacy and his confidence in using his voice to bond with his infant.
5. The mediator of parental self-efficacy is influenced by several moderating variables, resulting in a moderated mediator.
 - a. The co-parent relationship, father-staff relationship and the father's view of his role in the NICU moderate the relationship between the intervention and parental self-efficacy.
 - b. The father's role, which includes his views on his role and his level of involvement, is also affected by the co-parent relationship and the father's relationship with the medical staff.
6. The strength of the intervention will be moderated by the following variables: the father's prenatal attachment, his state of mind, the infant's characteristics, the father's workplace demands, the amount of time the father spends in the NICU and the family's demographic variables. The father's distress will also moderate the strength of the intervention.
 - a. The father's state of mind moderates his prenatal attachment.
 - b. The father's workplace demands partially mediate the amount of time he is able to spend in the NICU.

The theory-based conceptual framework identifies the key constructs that can be taken into consideration when designing an intervention to support paternal (i.e. fathers') attachment with their infants born prematurely and hospitalized in the NICU. These constructs represent a different experience than an intervention to promote mothers' attachment with their premature infants in the NICU. The theoretical framework of ecological systems theory and causal modeling was used to identify the various constructs discussed in the extant literature in order to explore relationships between the constructs. The conceptual framework for a music-based bonding intervention for fathers of premature infants in the NICU is an original framework that combines formal theories with evidence from the literature.

Chapter 5

Discussion

The purpose of this study is to develop a theory-based conceptual framework to identify the key constructs that should be taken into consideration when designing an intervention to support paternal (i.e. fathers') attachment with their infants born prematurely and hospitalized in the NICU. The theoretical framework of ecological systems theory and causal modeling was used to identify the various constructs discussed in the extant literature in order to explore relationships between the constructs. The conceptual framework for a music-based bonding intervention for fathers of premature infants in the NICU illustrated in the previous chapter is an original framework that combines formal theories with evidence from the literature.

Strengths of the Conceptual Framework

Theoretical and conceptual frameworks clarify the problem that an intervention targets (Fleury & Sidani, 2012, p. 12). This framework illustrates the multifaceted experience of fatherhood in the NICU. It is comprehensive in nature. Looking at the father's ecology within and outside of the NICU is beneficial in order to understand the variables that influences fathers' abilities to interact and bond with his infant. This also aligns with fathers' distinct experience as a parent. Fathers seem to be influenced by other factors, including the co-parent relationship, more so than mothers. Acknowledging the context of the intervention may help the intervention be more acceptable for fathers in the NICU environment. Understanding the problem is crucial for intervention development (Fleury & Sidani, 2012).

A strength of this model is the integration of the qualitative and quantitative research. Qualitative research can help describe the target population's experience within a setting and the complex reality of a human experience (Fleury & Sidani, 2012). The qualitative research in this

study has also illuminated some of the emotional experiences of fathers in the NICU, as well as the larger social factors that drive fathers' presence and involvement in caregiving. Another strength of this model is the use of literature across disciplines, including research from the nursing literature, developmental psychology, sociology and music therapy. Ecological systems theory and attachment theory, two well-established formal theories, ground the framework. Attachment theorists are calling for more integration of attachment theory with other theoretical frameworks, including ecological theory (Palm, 2014). The conceptual framework for a music-based bonding intervention for fathers with premature infants in the NICU meets this need.

This conceptual framework identifies who would benefit from a bonding intervention and in what context. In this case, the conceptual framework acknowledges that the father's role/level of involvement may influence his decision to participate in his infant's care in the NICU. A music therapy intervention may be most effective when a father sees his role as equal to that of the mother. Alternatively, the strength or dosage of the intervention might be tailored to meet the father's needs depending on his identified role.

Theory can identify mediating processes at work regarding the phenomenon of interest (Fleury & Sidani, 2012). This conceptual framework for a music-based bonding intervention identifies those mediators as a father's coping skills, his parental self-efficacy and his confidence in using his voice to interact with his infant in order to achieve an outcome of increased paternal bonding. The mediators are the mechanism of change (Fleury & Sidani, 2012). These variables must be able to change due to the intervention in order to also change the outcome variable (Fleury & Sidani, 2012). Ultimately, the theory presented here will be integral for designing an intervention for fathers with premature infants in the NICU. In this case, both the outcomes and the mediating variables will need to be accounted for in the music-based bonding intervention.

The conceptual framework also indicates that the timing for this intervention needs to accommodate fathers' availability. By presenting a comprehensive view of this problem, the intervention research will be translatable to practice (Fleury & Sidani, 2012).

Focusing on fathers fills a need in the literature, including attachment theory research, NICU nursing research and music therapy research. When the mother-infant attachment relationship is seen as the primary attachment relationship, this may unfairly exclude groups underrepresented in research, including heterosexual and gay fathers. Similarly, focusing only on the female voice as an intervention may also exclude male and transgender parents. This study recognizes the importance of all caregiver-infant attachments.

Limitations

As stated previously, the literature on fatherhood is limited (Genesoni & Tallandini, 2009; Singley & Edwards, 2015; Slade et al., 2009). Gay parents and transgender parents are not well represented in the literature (Biblarz & Stacey, 2010). For research focused on fatherhood, the majority of the participants are heterosexual, cisgender² males in long-term relationships with heterosexual, cisgender females. A long-term relationship is often defined as marriage or cohabitation. Defining the relationship in this way tends to over-represent white, middle- and upper-class men. Fatherhood may be different for these parents and societal expectations would differ as well. Therefore, this framework may have limited generalizability to all fathers with premature infants in the NICU.

² Cisgender describes a gender identity that conforms to birth sex; not transgender (*Oxforddictionaries.com*, 2016)

A limitation of this framework is the lack of specified measures for each construct. As the first step in an iterative process, this conceptual framework was not yet intended to be a statistical model. More research is needed before the model is tested, including intervention development. Other gaps in the literature were also identified through the creation of this conceptual framework. More research regarding fatherhood and attachment is warranted, including the development of more sensitive measures to assess father-infant attachment. Parental self-efficacy studies often focus on mothers' parental self-efficacy, including research regarding new domain-specific measures of parental self-efficacy in the NICU (Guimond et al., 2008; Pennell, Whittingham, Boyd, Sanders, & Colditz, 2012).

This conceptual framework focuses on fathers' experiences within the NICU. It does not account for events after discharge. Fathers' involvement patterns and parental roles may change once the infant is home. The framework also focuses exclusively on the father, which does not include an intervention that would target both parents simultaneously with their infant. Due to the influence of the co-parent relationship, the potential for change may be even greater when both parents are present. It would also be more generalizable to the home setting.

The complexity of attachment and bonding, as well as the experience of parenting in the NICU is difficult to capture in one model. It is likely there are many causes relating to parent and infant outcomes that are not accounted for in this model. The constructs presented may also influence each other in many, interrelated ways. For parsimony, this framework was limited to most salient variables from the literature review. Some constructs, such as coping strategies, have other influences beyond the scope of this project. While the model may not capture the full complexity of fatherhood, it does present a starting point for intervention development, implications for music therapy practice and future research.

Future Research Directions

The conceptual framework illustrated in the previous chapter sets the stage for future research in music therapy. One next step would be designing the intervention using this conceptual framework as a guide. However, more information would be of benefit before designing the intervention. There is a paucity of research on fathers' use of ID singing with their infants. Therefore, it would be beneficial to understand fathers' thoughts about and use of his voice. This could be modeled after the Shoemark and Arnup (2014) study regarding mother's use of voice in the NICU. This study would be qualitative in nature in order to understand fathers' experiences in more detail regarding their voice. It might also help determine appropriate measures for father's confidence in his voice.

Further, more research is needed to measure the musical and behavioral characteristics of fathers using ID singing. This may be an adaptation of de l'Eoile's (2006a) analysis of ID singing using mother and infant dyads. Analyzing the musical characteristics in more detail, as well as the infants' responses would help determine the effectiveness of fathers' ID singing with their infants. While research indicates that fathers use ID singing differently than mothers (Trehub, Unyk, et al., 1997), more information is needed to understand the infant's responses to ID singing by fathers. Likewise, more information is needed to understand premature infants' preferences and responses to ID singing. Premature infants have less exposure to sound in the womb and may have different aural preferences when compared to full-term infants.

A comparison is also warranted regarding the timbre of male and female voices. Classifying vocal timbre as equivalent to gender classifications is a logical error. Vocal timbre is different than gender or pitch range, although it is likely influenced by both. ID singing is characterized by a "loving tone" easily identifiable by adult listeners (O'Neill et al., 2001, p.

416). More quantitative measures of timbre during ID singing may help identify the timbral qualities that are linked with a “loving tone” and positive infant outcomes. The intervention will be more predictable and efficacious when the music mechanisms are clarified, including considerations for specific musical elements such as timbre.

Future intervention design will take into account the information provided in the conceptual framework. The environment and demographics of the setting may be unique to each NICU. The methodology of future studies can also be influenced by ecological theory (Onwuegbuzie, Collins & Frels, 2013). A longitudinal study would also be beneficial in order to determine not only the fathers’ bonding and infant outcomes delineated in the model but also the quality of the father-infant attachments, measurable after infancy.

Implications for Practice

Music therapy practice in the NICU can be more inclusive of fathers. Music therapists should understand fathers’ unique experience of becoming a parent in the NICU. Fathers should be encouraged to participate in music therapy with their infant with the understanding that they may decline. The music therapy program may also need to accommodate the needs of fathers by offering services during evening or weekend hours. Similarly, music therapist can communicate clearly with fathers before, during and after clinical services. Music therapists should strive to communicate with fathers in other ways if the father is not present during music therapy. This could include written communication, with the understanding that too much written information is not preferred. Likewise, parent-friendly communication appropriate for the cultural context of the family is recommended (Hanson-Abromeit et al., 2008).

Music therapists in a family-centered model should account for their own gender and the gender of the parent or caregiver(s) when designing and facilitating music therapy interventions

for an infant in the NICU. Fathers may use ID singing differently than mothers. In addition, fathers choose different music to sing to their infants, including popular music and created music (Trehub, Unyk et al., 1997). The complexity of this music may be over-stimulating for premature infants. However, the elements of music may be manipulated to best meet the needs of the infant, similarly to the concept of song of kin (Loewy, 2015). Music therapists can help fathers adapt their chosen or created music to meet the needs of their premature infant. Using fathers' chosen music may help increase the fathers' self-efficacy and his willingness to participate. This may also be a way for fathers to cope with the distress associated with the experience in the NICU.

When considering the distress parents experience having a premature infant admitted to the NICU, therapists should understand that fathers might express emotion differently than mothers. The emotional experience of both parents is especially important due to the influence of the co-parent relationship on the father (Binder et al., 2011). Music therapy can treat the whole family in the NICU. Music therapists should consider group sessions for parents in the NICU. Fathers may benefit from support groups and seeing other fathers sharing similar experiences. Lack of support and role models is a theme throughout the literature on fatherhood. Lack of social support is also a risk factor for depression (Musser et al., 2013).

The experience of becoming a father does not start at birth. Music therapists may be able to provide a continuum of care for fathers during pregnancy, through birth and after discharge in outpatient clinics. It would benefit the father to increase his involvement in prenatal preparation (Hugill et al., 2013) and create a plan for the delivery and after birth (Johnson, 2008). Most importantly, music therapists should look inward to determine their own views on parenting and

fatherhood. This likely will impact therapists' perception of fathers and their behaviors in the NICU (Hugill et al., 2013).

Conclusion

There is a need for music therapy research and practice to include fathers. In the NICU, fathers have a distinct experience that differs from mothers' experiences. Due to the stressful nature of the NICU and the distress associated with premature birth, fathers may have difficulty forming secure attachments with their infants. Fathers also face other barriers to their involvement in caregiving, including workplace demands. Relationships with the NICU staff and the co-parent may have a greater influence on fathers' behavior when compared to mothers. Music therapy, including infant-directed singing, may be a natural way for parents to bond with their baby in this setting. Fathers show different behaviors when interacting with their infants through ID singing.

More complex models are called for to understand father-child attachment, including integration with other theories (Palm, 2014). The purpose of this study was to understand the unique experience of fathers with a premature infant admitted to the NICU in order to generate a theory-based conceptual framework to inform how music therapy intervention can increase secure father-infant attachment relationships. The constructs from an iterative review of literature were framed by ecological systems theory and causal modeling. The conceptual framework for a music-based bonding intervention for fathers with premature infants in the NICU is an original framework that is grounded in formal theory. It is the beginning step toward intervention development to promote bonding and attachment for the father-premature infant dyad in the NICU.

References

- Aigen, K. (2005). Naturalistic inquiry. In B. Wheeler (Ed.), *Music therapy research* (2nd ed., pp. 352-364). Gilsum, NH: Barcelona Publishers.
- Aigen, K. (2015). Music therapy research needs: The identity of music therapy and the uniqueness of our dilemma. In *Improving Access and Quality: Music Therapy Research 2025 Proceedings* (pp. 37-43). Retrieved from <http://www.musictherapy.org/assets/1/7/MTR2025proceedings.pdf>
- American Music Therapy Association (AMTA). (2015a). *2015 AMTA Member Survey and Workforce Analysis*. Retrieved from <http://www.musictherapy.org/assets/1/7/15WorkforceAnalysis.pdf>
- American Music Therapy Association (AMTA). (2015b, November 13). Executive summary. In *Improving Access and Quality: Music Therapy Research 2025 Proceedings*. Retrieved from <http://www.musictherapy.org/assets/1/7/MTR2025proceedings.pdf>
- American Psychiatric Association. (2013). Highlights of changes from DSM-IV-TR to DSM-5. Retrieved from <http://www.dsm5.org/Documents/changes%20from%20dsm-iv-tr%20to%20dsm-5.pdf>.
- Attachment. (2015). In G. R. VandenBos (Ed.), *APA Dictionary of Psychology* (2nd ed., p. 86). Washington, DC: American Psychological Association. Retrieved from <http://www.ebrary.com>
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall, Inc.

- Bargiel, M. (2004). Lullabies and play songs: Theoretical considerations for an early attachment music therapy intervention through parental singing for developmentally at-risk infants. *Voices: A World Forum for Music Therapy*, 4(1). Retrieved from <https://normt.uib.no/index.php/voices/article/viewArticle/149/125>
- Beck, C. T. (2004). Birth trauma: In the eye of the beholder. *Nursing Research*, 53(1), 28-35. Retrieved from <http://tinyurl.com/zwwghfr>
- Beck, S. A., Weis, J., Greisen, G., Andersen, M., & Zoffmann, V. (2009). Room for family-centered care – a qualitative evaluation of a neonatal intensive care unit remodeling project. *Journal of Neonatal Nursing*, 15(3), 88-99. doi:10.1016/j.jnn.2009.01.006
- Beckett, C., & Taylor, H. (2010). *Human growth and development* (2nd ed.). London: SAGE Publications, Inc.
- Biblarz, T. J., & Stacey, J. (2010). How does the gender of parents matter? *Journal of Marriage and Family*, 72(1), 3-22. doi:10.1111/j.1741-3737.2009.00678.x
- Binder, W. S., Zeltzer, L. K., Simmons, C. F., Mirocha, J., & Pandya, A. (2011). The father in the hallway: Posttraumatic stress reactions in fathers of NICU babies. *Psychiatric Annals*, 41(8), 396-402. doi:10.3928/00485713-20110727-05
- Blalock, H. M. (1991). Are there really any constructive alternatives to causal modeling? *Sociological Methodology*, 21, 325–335. doi:10.2307/270941
- Bonding. (2015). In G. R. VandenBos (Ed.), *APA Dictionary of Psychology* (2nd ed., p. 138). Washington, DC: American Psychological Association. Retrieved from <http://www.ebrary.com>

- Bradley, R., & Slade, P. (2011). A review of mental health problems in fathers following the birth of a child. *Journal of Reproductive and Infant Psychology, 29*(1), 19-42. doi: 10.1080/02646838.2010.513047
- Bretherton, I. (1992). The origins of attachment theory: John Bowlby and Mary Ainsworth. *Developmental Psychology, 28*(5), 759-775. doi:10.1037/0012-1649.28.5.759
- Bronfenbrenner, U. (1979). *Ecology of human development: Experiments by nature and design*. Cambridge, MA, USA: Harvard University Press. Retrieved from <http://www.ebrary.com>
- Bronfenbrenner, U. (1986). Ecology of the family as a context for human development: Research perspectives. *Developmental Psychology, 22*(6), 723-742. doi: 10.1037/0012-1649.22.6.723
- Cabrera, N. J., Tamis-LeMond, C. S., Bradley, R. H., Hofferth, S. & Lamb, M.E. (2000). Fatherhood in the twenty-first century. *Child Development, 71*(1), 127-136. doi: 10.1111/1467-8624.00126
- Centers for Disease Control and Prevention. (2015, December 4). *Maternal and Infant Health: Preterm Birth*. Retrieved from <http://www.cdc.gov/reproductivehealth/MaternalInfantHealth/PretermBirth.htm>
- Chin, R., Hall, P., & Daiches, A. (2011). Fathers' experiences of their transition to fatherhood: A metasynthesis. *Journal of Reproductive and Infant Psychology, 29*(1), 4-18. doi:10.1080/02646838.2010.513044
- Cisgender. (2016). In *Oxforddictionaries.com*. Retrieved March 20, 2016, from http://www.oxforddictionaries.com/us/definition/american_english/cisgender

- Cockcroft, S. (2012). How can family centered care be improved to meet the needs of parents with a premature baby in neonatal intensive care? *Journal of Neonatal Nursing*, 18(3), 105-110. doi:10.1016/j.jnn.2011.07.008
- Condon, J., Corkindale, C., Boyce, P., & Gamble, E. (2013). A longitudinal study of father-to-infant attachment: Antecedents and correlates. *Journal of Reproductive and Infant Psychology*, 31(1), 15-30. doi:10.1080/02646838.2012.757694
- Conrad, N. J., Walsh, J., Allen, J. M., & Tsang, C. D. (2011). Examining infants' preferences for tempo in lullabies and playsongs. *Canadian Journal of Experimental Psychology/Revue Canadienne De Psychologie Expérimentale*, 65(3), 168-172. doi:10.1037/a0023296
- Cooper, L. G., Gooding, J. S., Gallagher, J., Sternesky, L., Ledsky, R., & Berns, S. D. (2007). Impact of a family-centered care initiative on NICU care, staff and families. *Journal of Perinatology*, 27, S32-S37. doi:10.1038/sj.jp.7211840
- Coping strategy. (2015). In G. R. VandenBos (Ed.), *APA Dictionary of Psychology* (2nd ed., pp. 252-253). Washington, DC: American Psychological Association. Retrieved from <http://www.ebrary.com>
- Creighton, A. L., Atherton, M., & Kitamura, C. (2013) Singing play song and lullabies: Investigating the subjective contributions to maternal attachment constructs. *The Australian Journal of Music Therapy*, 24, 17-47. Retrieved from <http://search.proquest.com/docview/1433230154?accountid=14556>
- Cross, I. (2001). Music, cognition, culture, and evolution. *Annals of the New York Academy of Sciences*, 930, 28-42. doi: 10.1111/j.1749-6632.2001.tb05723.x
- Cross, I. (2003). Music and evolution: Consequences and causes. *Contemporary Music Review*, 22(3), 79-89. doi:10.1080/0749446032000150906

- Davis, W. B., & Gfeller, K. E. (2008). Music therapy: Historical perspective. In W. B. Davis, K. E. Gfeller, & M. H. Thaut (Eds.), *An introduction to music therapy theory and practice* (3rd Ed.) (pp. 17-39). Silver Spring, MD: The American Music Therapy Association, Inc.
- de l'Etoile, S. K. (2006a). Infant behavioral responses to infant-directed singing and other maternal interactions. *Infant Behavior and Development*, *29*(3), 456-470.
doi:10.1016/j.infbeh.2006.03.002
- de l'Etoile, S. K. (2006b). Infant-directed singing: A theory for clinical intervention. *Music Therapy Perspectives*, *24*, 22-29. doi: 10.1093/mtp/24.1.22
- de l'Etoile, S. K. (2011). Acoustic parameters of infant-directed singing in mothers with depressive symptoms. *Infant Behavior & Development*, *34*(2), 248-256.
doi:10.1016/j.infbeh.2010.12.013
- de l'Etoile, S. K. (2015). Self-regulation and infant-directed singing in infants with Down syndrome. *Journal of Music Therapy*, *52*(2), 195-220. Retrieved from <http://search.proquest.com/docview/1737436304?accountid=14556>
- Deave, T., & Johnson, D. (2008). The transition to parenthood: What does it mean for fathers? *Journal of Advanced Nursing*, *63*(6), 626-633. doi:10.1111/j.1365-2648.2008.04748.x
- Distress. (2015). In G. R. VandenBos (Ed.), *APA Dictionary of Psychology* (2nd ed., p. 326). Washington, DC: American Psychological Association. Retrieved from <http://www.ebrary.com>
- Edwards, J. (2011). The use of music therapy to promote attachment between parents and infants. *The Arts in Psychotherapy*, *38*(3), 190-195. doi: 10.1016/j.aip.2011.05.002

- Edwards, J. (2014). The role of the music therapist in promoting parent-infant attachment. *Canadian Journal of Music Therapy, 20*(1), 38-48. Retrieved from <http://search.proquest.com/docview/1562002705?accountid=14556>
- Elmir, R., & Schmied, V. (2016). A meta-ethnographic synthesis of fathers' experiences of complicated births that are potentially traumatic. *Midwifery, 32*, 66-74. doi: 10.1016/j.midw.2015.09.008
- Elmir, R., Schmied, V., Wilkes, L., & Jackson, D. (2010). Women's perceptions and experiences of a traumatic birth: A meta-ethnography. *Journal of Advanced Nursing, 66*(10), 2142-2153. doi:10.1111/j.1365-2648.2010.05391.x
- Endendijk, J. J., Groeneveld, M. G., van Berkel, S. R., Hallers-Haalboom, E. T., Mesman, J., & Bakermans-Kranenburg, M. J. (2013). Gender stereotypes in the family context: Mothers, fathers, and siblings. *Sex Roles, 68*, 577-590. doi: 10.1007/s11199-013-0265-4
- Feeley, N. (2011). Posttraumatic stress among mothers of very low birthweight infants at 6 months after discharge from the neonatal intensive care unit. *Applied Nursing Research, 24*(2), 114-117. doi:10.1016/j.apnr.2009.04.004
- Feeley, N., Sherrad, K., Waitzer, E., & Boisvert, L. (2013). The father at the bedside: Patterns of involvement in the NICU. *The Journal of Perinatal & Neonatal Nursing, 27*(1), 72-80. doi:10.1097/JPN.0b013e31827fb415
- Fenech, G., & Thomson, G. (2014). Tormented by ghosts from their past: A meta-synthesis to explore the psychosocial implications of a traumatic birth on maternal well-being. *Midwifery, 30*(2), 185-193. doi: 10.1016/j.midw.2013.12.004

- Fleury, J., & Sidani, S. (2012). Using theory to guide intervention research. In B. M. Melnyk & D. Morrison-Beedy (Eds), *Intervention research: Designing, conducting, analyzing, and funding* (pp. 11-36). New York, NY: Springer Publishing Company, LLC.
- Friedman, S. H., Kessler, A., Yang, S. N., Parsons, S., Friedman, H., & Martin, R. J. (2013). Delivering perinatal psychiatric services in the neonatal intensive care unit. *Acta Paediatrica*, *102*(9), e392-e397. doi: 10.1111/apa.12323
- Genesoni, L., & Tallandini, M. A. (2009). Men's psychological transition to fatherhood: An analysis of the literature, 1998-2008. *Birth*, *36*, 305-317.
- Ghorbani, M., Dolatian, M., Shams, J., Alavi-Majd, H., & Tavakolian, S. (2014). Factors associated with posttraumatic stress disorder and its coping styles in parents of preterm and full-term infants. *Global Journal of Health Science*, *6*(3), 65-73. doi: 10.5539/gjhs.v6n3p65
- Gooding, J. S., Cooper, L. G., Blaine, A. I., Franck, L. S., Howse, J. L., & Berns, S. D. (2011). Family support and family-centered care in the neonatal intensive care unit: Origins, advances, impact. *Seminars in Perinatology*, *35*(1), 20-28. doi: 10.1053/j.semperi.2010.10.004
- Guimond, A. B., Wilcox, M. J., & Lamorey, S. G. (2008). The early intervention parental self-efficacy scale (EIPSES). *Journal of Early Intervention*, *30*(4), 295-320. doi: 10.1177/1053815108320814
- Hanson-Abromeit, D. (2003). The Newborn Individualized Developmental Care and Assessment Program (NIDCAP) as a model for clinical music therapy interventions with premature infants. *Music Therapy Perspectives*, *21*(2), 60-68. doi:10.1093/mtp/21.2.60

- Hanson-Abromeit, D., Shoemark, H., & Loewy, J. V. (2008). Newborn Intensive Care Unit. In D. Hanson-Abromeit & C. M. Colwell (Eds.), *Medical music therapy for pediatrics in hospital settings: Using music to support medical interventions* (pp. 15-69). Silver Spring, MD: The American Music Therapy Association, Inc.
- Harrison, M. J., & Magill-Evans, J. (1996). Mother and father interactions over the first year with term and preterm infants. *Research in Nursing and Health*, 19, 451-459. doi: 10.1002/(SICI)1098-240X(199612)19:6<451::AID-NUR1>3.0.CO;2-N
- Health Professional Radio. (2013, August 16). Study of the effects of music therapy on premature infants [Interview with Joanne Loewy]. Retrieved from <http://healthprofessionalradio.com.au/2013/08/16/study-of-the-effects-of-music-therapy-on-premature-infants/>
- Hoffenkamp, H. N., Tooten, A., Hall, R. A., Braeken, J., Eliëns, M. P., Vingerhoets, A. J., & van Bakel, H. J. (2015). Effectiveness of hospital-based video interaction guidance on parental interactive behavior, bonding, and stress after preterm birth: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, 83(2), 416-429. doi: 10.1037/a0038401
- Hugill, K., Letherby, G., Reid, T., & Lavender, T. (2013). Experiences of fathers shortly after the birth of their preterm infants. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, 42(6), 655-663. doi:10.1111/1552-6909.12256
- Institute for Patient- and Family-Centered Care. (2010, December 29). *Frequently Asked Questions*. Retrieved from: <http://www.ipfcc.org/faq.html>
- Jaccard, J., & Jacoby, J. (2010). *Theory construction and model-building skills: A practical guide for social scientists*. New York, NY: The Guildford Press.

- Jackson, K., Ternstedt, B., & Schollin, J. (2003). From alienation to familiarity: Experiences of mothers and fathers of preterm infants. *Journal of Advanced Nursing*, *43*(2), 120-129. doi:10.1046/j.1365-2648.2003.02686.x
- Jacobsen, S. L., McKinney, C. H., & Holck, U. (2014). Effects of a dyadic music therapy intervention on parent-child interaction, parent stress, and parent-child relationship in families with emotionally neglected children: A randomized controlled trial. *Journal of Music Therapy*, *51*(4), 310-332. Retrieved from <http://search.proquest.com/docview/1683486352?accountid=14556>
- Johnson, A. N. (2008). Engaging fathers in the NICU: Taking down the barriers to the baby. *The Journal of Perinatal & Neonatal Nursing*, *22*(4), 302-306. doi:10.1097/01.JPN.0000341361.37822.34
- Johnson, K., Caskey, M., Rand, K., Tucker, R., & Vohr, B. (2014). Gender difference in adult-infant communication in the first months of life. *Pediatrics*, *134*(6), e1603-1610. doi: 10.1542/peds.2013-4289
- Jones, L., Woodhouse, D., & Rowe, J. (2007). Effective nurse parent communication: A study of parents' perceptions in the NICU environment. *Patient Education and Counseling*, *69*, 206-212. doi: 10.1016/j.pec.2007.08.014
- Juffer, F., Hoksbergen, R. A., Riksen-Walraven, J. M., & Kohnstamm, G. A. (1997). Early intervention in adoptive families: Supporting maternal sensitive responsiveness, infant-mother attachment and infant-competence. *Journal of Child Psychology and Psychiatry*, *38*(8), 1039-1050, doi: 10.1111/j.1469-7610.1997.tb01620.x

- Kaneshiro, N. K. (2014, November 20). Premature infant: MedlinePlus Medical Encyclopedia. Retrieved March 27, 2016, from <https://www.nlm.nih.gov/medlineplus/ency/article/001562.htm>
- Kisilevsky, B. S., Hains, S. M., Lee, K., Xie, X., Huange, H., Ye, H. H., Zhang, K., & Wang, Z. (2003). Effects on experience on fetal voice recognition. *Psychological Science, 14*(3), 220-224. Retrieved from http://www.jstor.org.www2.lib.ku.edu/stable/40063892?seq=1#page_scan_tab_contents
- Korja, R., Latva, R., & Lehtonen, L. (2012) The effects of preterm birth on mother-infant interaction and attachment during the infant's first two years. *Acta Obstetricia et Gynecologica Scandinavica, 91*(2), 164-173. doi: 10.1111/j.1600-0412.2011.01304.x
- Lantz, B. (2013). Gender differences in reasons, facilitators, and barriers for parental presence in the NICU. *Nordic Journal of Nursing Research, 33*(1), 61-63. doi: 10.1177/010740831303300113
- Loewy, J. (2013). Song of kin. In K. Kirkland (ed.), *International Dictionary of Music Therapy*. (pp. 123-124). New York, NY: Routledge.
- Loewy, J. (2015). NICU music therapy: Song of kin as critical lullaby in research and practice. *Annals of the New York Academy of Sciences, 1337*(1), 178-185. doi:10.1111/nyas.12648
- Lucassen, N., Tharner, A., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Volling, B. L., Verhust, F. C., . . . Tiemeier, H. (2011). The association between paternal sensitivity and infant–father attachment security: A meta-analysis of three decades of research. *Journal of Family Psychology, 25*(6), 986-992. doi:10.1037/a0025855

- Lytton, H., & Romney, D. M. (1991). Parents' differential socialization of boys and girls: A meta-analysis. *Psychological Bulletin*, *109*(2), 267-296. doi:10.1037/0033-2909.109.2.267
- Masataka, N. (2009). The origins of language and the evolution of music: A comparative perspective. *Physics of Life Reviews*, *6*(1), 11-22. doi:10.1016/j.plrev.2008.08.003
- McAlpin, E. L. (2013). *Promoting parent-child secure attachment bonds in adoptive families through community-based family music groups: A heuristic grounded theory study*. (1542210 A.M.), University of Missouri - Kansas City, Ann Arbor. Retrieved from <http://search.proquest.com.www2.lib.ku.edu/pqdtglobal/docview/1425356188/F7B788F730A748F3PQ/2?accountid=14556>
- McBride, B. A., Schoppe, S. J., & Rane, T. R. (2002). Child characteristics, parenting stress, and parental involvement: Fathers versus mothers. *Journal of Marriage and Family*, *64*(4), 998–1011. Retrieved from <http://www.jstor.org.www2.lib.ku.edu/stable/3599998>
- McDermott, J., & Hauser, M. (2005). The origin of music: Innateness, uniqueness, and evolution. *Music Perception*, *23*(1), 29-59
- Murdock, K. W. (2013). An examination of parental self-efficacy among mothers and fathers. *Psychology of Men & Masculinity*, *14*(3), 314-323. doi: 0.1037/a0027009
- Musser, A. K., Ahmed, A. H., Foli, K. J., & Coddington, J. A. (2013). Paternal postpartum depression: What health care providers should know. *Journal of Pediatric Health Care*, *27*(6), 479-485. doi:10.1016/j.pedhc.2012.10.001
- O'Neill, C. T., Trainor, L. J., & Trehub, S. E. (2001). Infants' responsiveness to fathers' singing. *Music Perception: An Interdisciplinary Journal*, *18*(4), 409–425. <http://doi.org/10.1525/mp.2001.18.4.409>

- Onwuegbuzie, A. J., Collins, K. M. T., & Frels, R. K. (2013). Using Bronfenbrenner's ecological systems theory to frame quantitative, qualitative, and mixed research. *International Journal of Multiple Research Approaches*, 7(1), 2-8. doi:10.5172/mra.2013.7.1.2
- Palm, G. (2014). Attachment theory and fathers: Moving from "being there" to "being with." *Journal of Family Theory & Review*, 6(4), 282-297. doi:10.1111/jftr.12045
- Pasiali, V. (2012). Supporting parent-child interactions: Music therapy as an intervention for promoting mutually responsive orientation. *Journal of Music Therapy*, 49(3), 303-334. doi: 10.1093/jmt/49.3.303
- Pennell, C., Whittingham, K., Boyd, R., Sanders, M., & Colditz, P. (2012). Prematurity and parental self-efficacy: The preterm parenting and self-efficacy checklist. *Infant Behavior and Development*, 35(4), 678-688. doi: 10.1016/j.infbeh.2012.07.009
- Plantin, L., Olukoya, A. A., & Ny, P. (2011). Positive health outcomes of fathers' involvement in pregnancy and childbirth paternal support: A scope study literature review. *Fathering*, 9(1), 87-102. Retrieved from <http://search.proquest.com.www2.lib.ku.edu/docview/857841377?accountid=14556>
- Ravitch, S. M., & Riggan, M. (2012). *Reason & Rigor: How Conceptual Frameworks Guide Research*. Los Angeles, CA: SAGE Publications, Inc.
- Reis, M. D., Rempel, G. R., Scott, S. D., Brady-Fryer, B. A., & Van Aerde, J. (2010), Developing nurse/parent relationships in the NICU through negotiated partnership. *Journal of Obstetric, Gynecologic & Neonatal Nursing*, 39(6), 675-683. doi: 10.1111/j.1552-6909.2010.01189.x

- Reschke-Hernández, A. E. (2012). Music-based intervention reporting for children with autism: Implications for music therapy publication guidelines. *Music Therapy Perspectives*, 30(2), 167-175. doi:10.1177/1359105310374781
- Robb, S. L. (2012). Gratitude for a complex profession: The importance of theory-based research in music therapy. *Journal of Music Therapy*, 49(1), 2-6. doi: 10.1093/jmt/49.1.2
- Robb, S. L., & Carpenter, J. S. (2009). A review of music-based intervention reporting in pediatrics. *Journal of Health Psychology*, 14(4), 490-501. doi:10.1177/1359105309103568
- Robb, S. L., & Meadows, A. (2015). Cultures of inquiry in music therapy research and the changing landscape of knowledge generation and implementation. In *Improving Access and Quality: Music Therapy Research 2025 Proceedings* (pp. 19-23). Retrieved from <http://www.musictherapy.org/assets/1/7/MTR2025proceedings.pdf>
- Sarkadi, A., Kristiansson, R., Oberklaid, F., & Bremberg, S. (2008). Fathers' involvement and children's developmental outcomes: A systematic review of longitudinal studies. *Acta Paediatrica*, 97(2), 153-158. doi: 10.1111/j.1651-2227.2007.00572.x
- Schechter, D.S., & Willheim, E. (2009). Disturbance of attachment and parental psychopathology in early childhood. *Child and Adolescent Psychiatric Clinics*, 18(3), 665-686. doi: 10.1016/j.chc.2009.03.001
- Shaw, R. J., Bernard, R. S., Storfer-Isser, A., Rhine, W., & Horwitz, S. M. (2013). Parental coping in the neonatal intensive care unit. *Journal of Clinical Psychology in Medical Settings*, 20(2), 135-142. doi: 10.1007/s10880-012-9328-x

- Shaw, R. J., Deblois, T., Ikuta, L., Ginzburg, K., Fleisher, B., & Koopman, C. (2006). Acute stress disorder among parents of infants in the neonatal intensive care nursery. *Psychosomatics*, *47*(3), 206-212. Retrieved from <http://search.proquest.com.www2.lib.ku.edu/docview/220324848?accountid=14556#>
- Shoemark, H., & Arnup, S. (2014). A survey of how mothers think about and use voice with their hospitalized newborn infant. *Journal of Neonatal Nursing*, *20*(3), 115-121. doi:10.1016/j.jnn.2013.09.007
- Shoemark, H., & Dearn, T. (2008). Keeping parents at the centre of family-centred music therapy with hospitalised infants. *Australian Journal of Music Therapy*, *19*, 3-24. Retrieved from <http://search.proquest.com/docview/1467457?accountid=14556>
- Shoemark, H., Hanson-Abromeit, D., & Stewart, L. (2015). Constructing optimal experience for the hospitalized newborn through neuro-based music therapy. *Frontiers in Human Neuroscience*, *128*, 1-5. doi:10.3389/fnhum.2015.00487
- Singley, D. B., & Edwards, L. M. (2015). Men's perinatal mental health in the transition to fatherhood. *Professional Psychology: Research and Practice*, *46*(5), 309-316. doi:10.1037/pro0000032
- Sisson, H., Jones, C., Williams, R., & Lachanudis, L. (2015). Metaethnographic synthesis of fathers' experiences of the neonatal intensive care unit environment during hospitalization of their premature infants. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *44*(4), 471-480. doi:10.1111/1552-6909.12662
- Slade, A., Cohen, L. J., Sadler, L. S., & Miller, M. (2009). The psychology and psychopathology of pregnancy: Reorganization and transformation. In C. H. Zeanah, Jr. (Ed.), *Handbook of infant mental health* (pp. 421-434). New York, NY: The Guilford Press.

- Standley, J. (2012). Music therapy research in the NICU: An updated meta-analysis. *Neonatal Network, 31*(5), 311-316. Retrieved from <http://search.proquest.com.www2.lib.ku.edu/docview/1036954700?pq-origsite=360link#>
- Stige, B. (2015). The practice turn in music therapy theory. *Music Therapy Perspectives, 33*(1), 3-11. doi:10.1093/mtp/miu050
- Trainor, L. J., Clark, E. D., Huntley, A., & Adams, B. A. (1997). The acoustic basis of preferences for infant-directed singing. *Infant Behavior and Development, 20*(3), 383-396. doi:10.1016/S0163-6383(97)90009-6
- Transitional object. (2015). In G. R. VandenBos (Ed.), *APA Dictionary of Psychology* (2nd ed., p. 1102). Washington, DC: American Psychological Association. Retrieved from <http://www.ebrary.com>
- Trehub, S. E., Hill, D. S., & Kamenetsky, S. B. (1997). Parents' sung performances for infants. *Canadian Journal of Experimental Psychology/Revue Canadienne De Psychologie Expérimentale, 51*(4), 385-396. doi:<http://dx.doi.org/10.1037/1196-1961.51.4.385>
- Trehub, S. E., Unyk, A. M., Kamenetsky, S. B., Hill, D. S., Trainor, L. J., Henderson, J. L., & Saraza, M. (1997). Mothers' and fathers' singing to infants. *Developmental Psychology, 33*(3), 500-507. doi:<http://dx.doi.org/10.1037/0012-1649.33.3.500>
- Tremblay, S., & Pierce, T. (2011). Perceptions of fatherhood: Longitudinal reciprocal associations within the couple. *Canadian Journal of Behavioural Science/Revue Canadienne Des Sciences Du Comportement, 43*(2), 99-110. doi: 10.1037/a0022635
- Tsang, C. D., & Conrad, N. J. (2010). Does the message matter? The effect of song type on infants' pitch preferences for lullabies and playsongs. *Infant Behavior and Development, 33*(1), 96-100. doi:10.1016/j.infbeh.2009.11.006

- Ullal-Gupta, S., Vanden Bosh der Nederlanden, C. M., Tichko, P., Lahav, A., & Hannon, E. E. (2013). Linking prenatal experience to the emerging musical mind. *Frontiers in Systems Neuroscience, 7*, 1-7. doi:10.3389/fnsys.2013.00048
- van der Voort, A., Linting, M. , Juffer, F., Schoenmaker, C., Bakermans-Kranenburg, M., & van IJzendoorn, M. H. (2014). More than two decades after adoption: Associations between infant attachment, early maternal sensitivity and the diurnal cortisol curve of adopted young adults. *Child and Youth Services Review, 46*, 186-194. doi: 10.1016/j.chilyouth.2014.08.022
- van IJzendoorn, M. (1995). Adult attachment representations, parental responsiveness, and infant attachment: A meta-analysis on the predictive validity of the adult attachment interview. *Psychological Bulletin, 117*(3), 387-403. doi: 10.1037/0033-2909.117.3.387
- Van Riper, M. (2001). Family-provider relationships and well-being in families with preterm infants in the NICU. *Heart Lung, 30*(1), 74-84. doi:10.1067/mhl.2001.1110625
- Volkova, A., Trehub, S. E., & Schellenberg, E. G. (2006). Infants' memory for musical performances. *Developmental Science, 9*(6), 583-589. doi:10.1111/j.1467-7687.2006.00536.x
- Whipple, J. (2000). The effect of parent training in music and multimodal stimulation on parent-neonate interactions in the neonatal intensive care unit. *Journal of Music Therapy, 37*(4), 250-268. Retrieved from <https://search.ebscohost.com/login.aspx?direct=true&db=ofs&AN=507739388&site=ehost-live>

- Wu, A. D., & Zumbo, B. D. (2008). Understanding and using mediators and moderators. *Social Indicators Research*, 87(3), 367–392. Retrieved from <http://www.jstor.org/stable/27734670>
- Yu, C.-Y., Hung, C.-H., Chan, T.-F., Yeh, C.-H., & Lai, C.-Y. (2012). Prenatal predictors for father-infant attachment after childbirth. *Journal of Clinical Nursing*, 21(11-12), 1577-1583. doi:10.1111/j.1365-2702.2011.04003.x
- Zeanah, Jr., C. H., & Smyke, A. T. (2009). Attachment disorders. In C. H. Zeanah, Jr. (Ed.), *Handbook of infant mental health* (pp. 421-434). New York, NY: The Guilford Press.