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Adult Sensitivity: Parallels Between Language and Music Acquisition in Early Childhood

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Abstract

Researchers, scholars, and educators recognize parallels between language and music. Early learning and development takes place in social contexts and is socially constructed through interaction among and between adults and young children. Though researchers have learned much about ontogenetic development by investigating behaviors of young children in decontextualized settings, social interactions are at the heart of language and music acquisition. The purpose of this literature review is to synthesize and compare research on language and music acquisition and to recommend, based on that literature, a trajectory for music acquisition research. Specifically, this review of literature focuses on adult sensitivity (as it is defined in language acquisition research) and the three dimensions of adult sensitivity: identification, interpretation, and responsivity. It describes connections between those three dimensions in the context of language acquisition and in the context of music acquisition. In addition, suggestions are included for practice and future research based on the synthesis of literature.

Keywords*:* music, language, acquisition, identify, interpret, respond, children, infants, early childhood

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Researchers, scholars, and educators recognize parallels between language and music. Language and music are aurally perceived, temporally organized, and have some aspects that are universal and others that are cultural (McMullen & Saffran, 2004; Saffran, Johnson, Aslin, & Newport, 1999; Trehub, Trainor, & Unyk, 1993). Language and music share similar developmental precursors (H. Papoušek, 1996; Trevarthen, 2002), similar learning mechanisms (Saffran, 2003), and represent intimately related paths of ontogenetic development (e.g., Burton, 2015; Chen-Hafteck, 1997; Dissanayake, 2012; Gordon, 2003; Kelly & Sutton-Smith, 1987; H. Papoušek, 1996; Reynolds, 2006; Reynolds, Long, & Valerio, 2007; Valerio, 2008; Valerio, Seaman, Yap, Santucci, & Tu, 2006). Some have even suggested that musical ability informs and supports language development ((e.g., Brandt, Gebrian, & Slevc, 2012; Chen-Hafteck & Mang, 2012; Williams, Barratt, Welch, Abad, & Broughton, 2015). This learning and development takes place in social contexts and is socially constructed through interaction among and between adults and young children (Bruner, 1975; Vygotsky, 1978).

Humans are social beings and may be genetically predisposed to social interaction (Ainsworth, Bell, & Stayton, 1974). Social interaction is considered a prerequisite for learning in many domains (Snow, 1989), facilitates socially-constructed learning and development (Bruner, 1975; Vygotsky, 1978), and optimizes infants' abilities to learn language (Goldstein & Schwade, 2008; Kaye & Charney, 1980) and music (Adachi, 1994; Hsee, 2007; Ilari, 2016; Reynolds et al., 2007; Young, 2016). Interaction between adults and infants relies on adult sensitivity to the capacities of their young partners. "Children's learning and development across [multiple] domains may be enhanced by the provision of appropriate and stimulating learning environments

and by interacting with adults who are sensitive and responsive to their needs" (Suthers, 2001, p. 21).

Though researchers have learned much about music development by investigating music behaviors in decontextualized settings, social interactions are at the heart of language and music acquisition. Studies of infants' behaviors in decontextualized settings may be missing key factors that contribute to cognitive development—they lack the influence of social interaction and context on development (Trevarthen & Hubley, 1978). Reflecting on limitations of past research, Trevarthen (2002) stated, "It now seems grotesque how infants' psychological talents and initiatives have been so misrepresented and misperceived" (p. 26). Researchers such as Pond (1981) stood apart from their contemporaries when they described young children's music behaviors in the context of social interactions and referred to music interactions as musical "dialogues" (p. 8).

Language acquisition researchers have a well-established history of investigating development as a socially-mediated process—music acquisition researchers have begun to follow suit (e.g., Adachi, 1994; Berger & Cooper, 2003; Burton, 2011; deVries, 2005; Hicks, 1993; Hornbach, 2005, 2007; Hsee, 2007; Ilari, 2009; Metz, 1989; Reynolds, 1995, 2006; Reynolds, Long, & Valerio, 2007; Valerio, Seaman, Yap, Santucci, & Tu, 2006; Young, 2003, 2005; Young, Street, & Davies, 2007). Taggart (2011) suggests the difference between the progress of language acquisition research and music acquisition research may be related to society's value of language skills over musical skills in academic contexts. Despite society's imbalance of values, music acquisition researchers have recently begun to consider the ways in which language acquisition research could serve as a model for music acquisition research

(Burton, 2011; Reese, 2013; Taggart, 2011). What additional parallels can be drawn between adult-child linguistic interactions and adult-child music interactions? Could similarities and differences between adult-child interactions in linguistic and adult-child interactions in music contexts contribute to our understanding of music acquisition? What implications for music acquisition can we draw from language acquisition research? The purpose of this literature review is to synthesize and compare research on language and music acquisition and to recommend, based on that literature, a trajectory for music acquisition research. I will explore the phenomenon of adult sensitivity (as it is defined in language acquisition research) and the three dimensions of adult sensitivity: identification, interpretation, and responsivity. I will draw connections between those three dimensions in the context of language acquisition and the same three dimensions in the context of music acquisition. In addition, I will provide suggestions for practice and future research based on the synthesis of literature.

Adults' Sensitivity to Communicative Behaviors

Sensitivity is a multidimensional construct that contributes to adult-child interactions, attachment, and linguistic development (Ainsworth, Bell, & Stayton, 1974; DeWolff & Van Ijzendoorn, 1997; Paavola, Kemppinen, Kumpulainen, Moilanen, & Ebeling, 2006). Sensitivity is interpersonal, dyad-specific, and influenced by social, cultural, and intersubjective contexts (Classen & Crittenden, 2000; Murray & Trevarthen, 1986; Wilcox, Kouri, & Caswell, 1990). Dimensions of sensitivity include adults' abilities to identify communicative behaviors (Ainsworth et al., 1974), interpret meaning and intentionality (Camaioni, 1993; Classen & Crittenden, 2000), respond promptly and contingently (Ainsworth et al., 1974; Classen &

Crittenden, 2000), maintain the child's attention and motivation (Baumwell, Tamis-LeMonda, & Bornstein, 1997), and adjust behavior to elicit responses (Kaye & Charney, 1980).

Adults' Identifications of Communicative Behaviors

Identification of communicative behaviors is the first link in what Wilcox, Kouri, and Caswell (1990) call the *chain of responsivity.* Identification is a prerequisite for responding to and interacting with infants (Meadows, Elias, & Bain, 2000; Oller, Eilers, & Basinger, 2001). Without the ability to identify behaviors, the chain of responsivity has no beginning.

Parental status (biological parent vs. nonparent) is one factor that influences adults' abilities to identify communicative behaviors of infants. Parents, naturally and without specialized training, identify their infants' behaviors as communicative—even if the behaviors do not seem especially communicative to other adults (Adamson, 1995; Scoville, 1984). Mothers consistently identify communicative behaviors of their infants (Meadows et al., 2000). Fathers also consistently identify communicative behaviors of their infants and demonstrate high levels of agreement with the mother of their infant (Elias, Meadows, & Bain, 2003). Without any specialized training, parents accurately identify communicative behaviors of their infants and demonstrate high levels of agreement with trained experts (Oller, Eilers, & Basinger, 2001). In addition, some researchers suggest that parental status might make adults more sensitive to communicative behaviors of infants (Adamson, Bakeman, Smith, & Walters, 1987; Kamel & Dockrell, 2000).

Kamel and Dockrell (2000) found mothers identify more communicative behaviors demonstrated by their infant than unfamiliar adults. They suggest this difference is a result of idiosyncratic criteria used by the mother to identify communicative behaviors demonstrated by

her infant. However during a follow up study, when the researchers provided the mother's criteria for communicative behaviors, the adults identified similar numbers of communicative behaviors when compared to the mothers.

Though Kamel and Dockrell (2000) suggest parents have privileged abilities to identify communicative behaviors of their children, Elias and Meadows (2000) used a different data collection technique and found mothers and other adults (parents and non-parents) were equally capable of identifying communicative behavior. Elias and Meadows (2000) asked mothers and other adults to identify the duration of time during which an infant was communicating. They found the mothers and adults agreed when identifying durations of time during which they believed the infant (regardless of gender or age) was deliberately trying to communicate. The findings of these two studies suggest adults might be observing the same behaviors but parsing them differently depending on whether or not they are the parent of the child they are observing. When observing their child, parents seem to identify more individual behaviors within a communicative period than other adults observing their child. This propensity to identify individual communicative acts might help parents perceive more opportunities to interact with their child.

Researchers suggest adults (parents and nonparents) are capable of the first link in the *chain of responsivity:* identification of communicative behaviors. Though parents may seem more sensitive than nonparents when identifying the communicative behaviors of their own children, adults require no specialized training to identify communicative behaviors of young children. The next important link in the chain of responsivity is adults' abilities to interpret meaning and intentionality of communicative behaviors demonstrated by young children.

Adults' Interpretations of Communicative Behaviors

Researchers' definitions of the meaning and intentionality are not always the same; these differences affect their findings. A conservative definition of meaning and intentionality places the burden of evidence on the infants. For example, Harding and Golinkoff (1979) identified behaviors as communicative only when infants maintained eye contact with an adult, directed adults' attention toward a goal with gestures or looking, and continued the behavior until they or the adult accomplished the goal. Using this conservative definition of meaning and intentionality, they suggested children first begin to demonstrate intentionally communicative behaviors between 11- and 12-months-old. When researchers rely solely on infants' behaviors for evidence of meaning and intentionality, they struggle to agree on operational definitions of meaningful and intentional behaviors, and consequently disagree about the age at which intentionally communicative behavior manifests in young children (Scoville, 1984).

Conversely, other researchers use a liberal definition of meaning and intentionality. For example, Trevarthen (1977) identified silent and weakly voiced mouth and tongue movements of infants as communicative behaviors. Using this liberal definition of meaning and intentionality, Trevarthen suggested children first begin to demonstrate intentionally communicative behaviors as young as two-months-old. In addition, some researchers suggest taking the sole burden off infants. Harding (1984) emphasized shared responsibility between infants and adults and suggested researchers include adult inferences of intentions when investigating communicative intentionality of infants. Other researchers (Ryan, 1974; Scoville, 1984) remove the burden from the infant completely, and suggest investigating communicative intentionality as the sole property of the adult.

Adult attribution of meaning and intention to infants' communicative behaviors is a phenomenon investigated by many researchers (Adamson, 1995; Adamson et al., 1987; Kaye, 1979, 1982; Kaye & Charney, 1980; Miller, 1988; Nelson, 1973; Papoušek, 1995; Papoušek & Papoušek, 1987; Ryan, 1974; Vedeler, 1987). Adults often attribute meaning and intentionality to infants' communicative behaviors—researchers refer to this phenomenon as "thickening thin data" (Kaye, 1979), the "he says" phenomenon (Kaye, 1982), or the "as if" condition or hypothesis (Vedeler, 1987). Parents demonstrate the "as if" condition beginning in pregnancy (Kaye, 1982) and continue through the third year of their child's life (Kaye & Charney, 1980). Pregnant mothers demonstrate the "as if" condition when they translate movements of the fetus into communications: flipping somersaults in the womb implies requests for more spicy food, tiny kicks are requests for extrication from mother's stomach (Kaye, 1982). As their children mature and as their children's communicative behaviors evolve, mothers revise criteria for ascribing intentionality (Zeedyk, 1997). Although the "as if" condition seems instinctive, it is not demonstrated with the same frequency by all parents. Parents who have accurate knowledge of infant development and behavior ascribe meaning more often than parents who do not have accurate knowledge of infant development and behavior (Miller, 1988).

Adamson et al. (1987) asked adults (parents and nonparents) to watching video of mother-infant interactions. Some adults were asked to identify meaningfully communicative behaviors (those that seemed to make communicative sense); others were asked to identify intentionally communicative behaviors (those in which the infants seemed to be purposefully communicating). Regardless of parental status, adults identified similar numbers of intentionally communicative behaviors, but parents identified more meaningfully communicative behaviors

than nonparents. Level of agreement among all adults was higher when identifying intentionally communicative behaviors than when identifying meaningfully communicative behaviors and when infants in the video demonstrated conventional communicative behaviors like words and gestures. Parents' agreed more often than nonparents when identifying meaningfully communicative behaviors. Adults identified intentional behaviors more often when watching older infants playing with an adult and an object; they identified meaningful behaviors more often when watching younger infants playing alone with an object. Overall, the researchers suggest parents' criteria for attributing meaning is more liberal than non-parents' criteria due to parents' prior experiences with their own infant.

In a similar study, Kamel and Dockrell (2000) found mothers make significantly more attributions of intentionality when watching video of their infant than unfamiliar adults watching the same video. The researchers found mothers interpret intentionality of communicative behaviors based on dyad-specific understandings developed between mother and infant in the course of care-taking and interaction. Similar to Adamson et al., the researchers suggest parents may have an advantage when attributing intentionality to infants' communicative behaviors.

Parents' abilities to interpret meaning and intentionality contribute to the language development of their children. Parents are "skilled interpreters who translate a poorly formed [communicative behavior] into their own native language" (Adamson, 1995, p. 143).

> Whether or not it is true that the child 'is trying to say something,' and whether or not [meaning and intentionality are truly] ascertainable, it is an important fact about adults that they do behave toward children … as though the child was trying to say something. (Ryan, 1974, p. 201)

When mothers fail to successfully interpret the meaning and intention of their infants' communicative behaviors, rate of language acquisition and size of vocabulary suffers (Nelson, 1973). When adults interpret and respond to infants' communicative behaviors as if the behaviors are meaningful and intentional, infants develop into meaningful and intentional communicators (Harding, 1984; Ryan, 1974; Vedeler, 1987). The last link in the chain of responsivity is adults' abilities to respond to communicative behaviors demonstrated by young children.

Adults' Responses to Communicative Behaviors

To successfully complete the chain of responsivity, adults must respond promptly and contingently to communicative behaviors of young children (Bornstein, 1989; Bornstein & Tamis-LeMonda, 1989; Paavola, Kunnair, & Moilanen, 2005). Responses are prompt when they directly follow infants' communicative behaviors after a predictable and consistent pause (Zlochowder & Cohn, 1996). Responses are contingent when they depend on and relate to the content of infants' communicative behaviors (Goldstein & Schwade, 2008; Gros-Louis, West, Goldstein, & King, 2006). Adults contingently respond to infants' communicative behaviors in various ways: imitating and responding with a variation of the behavior, altering the content and context of the behavior, and extending and repeating the behavior (Adamson, 1995; Bruner, 1975, 1983; Gros-Louis et al., 2006; Kaye, 1979, 1982; Papoušek & Papoušek, 1981; Ryan, 1974; Tomasello, 1992). Imitation may be an instinctive behavior demonstrated by adults to stimulate, soothe, and interact with infants (Papoušek & Papoušek, 1981). Adults' imitations are not always exact replicas of infants' utterances; the imitations often become more adult-like variations or extensions of the original utterance (Kaye, 1979; Ryan, 1974). "In an effort to

understand what are regarded as attempts at speech, mothers often repeat or extend the child's utterance, or alter some aspect of the non-linguistic context" (Ryan, 1974, p. 201).

Adult responsivity influences linguistic development (Baumwell, Tamis-LeMonda, & Bornstein, 1997; Bruner, 1975; Goldstein, King, & West, 2003; Goldstein & Schwade, 2008; Snow, 1989), as well as the nature, content, pacing, and direction of interactions between adults and infants (Stern, 1985). Unsuccessful attempts to respond—characterized by interruptions or attempts to control or redirect communicative behaviors of infants—adversely affect infants' linguistic development (Goldstein et al., 2003; Snow, 1989; Zlochowder & Cohn, 1996). Successful responses—characterized by promptness and contingency—positively affect infants' linguistic development (Bruner, 1975; Goldstein et al., 2003; Goldstein & Schwade, 2008; M. Papoušek, 1996; Snow, 1989). When adults respond promptly and contingently, infants demonstrate successful lexical acquisition strategies (M. Papoušek, 1996; Snow, 1989), restructure their babble to incorporate aspects of adult communication (Goldstein & Schwade, 2008), incorporate advanced forms of language (Bruner, 1975), demonstrate developmentally advanced vocalizations, and reach increased numbers of language milestones (Goldstein et al., 2003).

Parallels with Music Acquisition

Adults' sensitivities to children's communicative behaviors impact children's language acquisition, and it is logical to imagine similar sensitivities to children's music behaviors might impact children's music acquisition. Though "sensitivity" is commonly used to describe the construct contributing to socially-mediated language development, the term is not as commonly used when describing adult-child music interactions (Dissanayake, 2001). Regardless, music

acquisition researchers have explored adults' abilities to identify, interpret meaning and intentionality of, and respond to young children's music behaviors.

Adults' Identifications of Music Behaviors

Researchers have begun to explore adults' abilities to identify young children's music behaviors as an independent dimension that contributes to music acquisition (Reese, 2013; Valerio et al., 2011). Though little is known about adults' abilities to identify music behaviors of young children, researchers have often relied on descriptions and identifications by researchers or trained observers (Berger & Cooper, 2003; Custodero, Calì, & Diaz-Donoso, 2016; Fox, 1990; Hicks, 1993; Metz, 1989; Miller, 1986; Moog, 1976; Moorehead & Pond, 1942/1978; Reynolds, 1995, 2006; Shelley, 1981; Sims, 1986; Valerio, 1998; Valerio et al., 2006; Young, 2002, 2003, 2004), parents (Burton, 2002; Custodero, 2005, 2006; Custodero & Johnson-Green, 2008; Hendricks & McPherson, 2010; Hornbach, 2005; Howe, Davidson, Moore, & Sloboda, 1995; Kelley & Sutton-Smith, 1987; Koops, 2014; Tafuri & Villa, 2002; Valerio, Reynolds, Morgan, McNair, 2012; Young et al., 2007), and teachers (Hornbach, 2005; Reese, 2013; Valerio, 2008; Valerio & Freeman, 2009; Valerio et al., 2011; Young et al., 2007). For the most part, researchers include identifications and descriptions of children's music behaviors made by trained observers, parents, and teachers without questioning the accuracy or consistency, or considering if there might be differences in adults' abilities based on any number of factors.

Adults' preconceived notions about traditional contexts for music behavior may influence their abilities to identify music behaviors demonstrated by young children. Adults often define music behaviors as those that occur during planned activities confined to adult-led circle time for singing traditional songs (Young, 2003). Custodero (2006) found parents focus on formal

instruction and structured early childhood music classes as contexts for identifying conventional music behaviors (singing traditional songs with text, clapping hands to the beat of a song, or playing instruments) and may be less inclined to identify unconventional movements and vocalizations as music behaviors in unstructured, play-based settings. Reese (2013) found adults are most likely to identify beat-related movements as musical behaviors and least likely to identify unconventional and unstructured vocalizations as music behaviors. Singing or other vocal musical behaviors may be especially challenging for adults to identify because young children's speaking and singing behaviors are often mixed or and often lack clear distinction according to adults' assumptions about singing (Mang, 2001).

Adults' musical orientation may influence their abilities to identify music behaviors demonstrated by young children. Factors affecting adults' musical orientation include years of formal music training and earning a degree in a music-related field (Demorest, Morrison, Beken, & Jungbluth, 2008), choice of music as a profession (Kelley & Sutton-Smith, 1987), importance of music in daily life (Kelley & Sutton-Smith, 1987), participation in music classes during formal schooling (Valerio & Freeman, 2009), participation as a parent of a child in an adult-child music class (Young et al., 2007), and attitude toward music (Reynolds, 1960). Parents who report few personal experiences with and little interest in music demonstrate less awareness of their infants' music behaviors than parents who report experience and interest in music or are professional musicians (Kelley & Sutton-Smith, 1987).

Researchers have found certain experiences contribute positively to adults' awareness of and ability to identify music behaviors of young children. Undergraduate early childhood development and elementary education majors perceived increase in their sensitivity to

children's music behaviors after participating in an early childhood music methods course during which they were encouraged to identify music behaviors while leading musical activities for young children (Valerio & Freeman, 2009). Mothers were more likely to comment on their infants' music behaviors after participating in a series of infant-parent music classes during which teachers identified and drew attention to musical responses of the infants (Young et al., 2007). Musicians with specialized early childhood music pedagogical training identified significantly more music behaviors of young children than adults (musicians and nonmusicians) without specialized pedagogical training (Reese, 2013).

Because context, type of behaviors, and experience influence adults' abilities to identify music behaviors of young children, early childhood music specialists should draw adults' attention to children's music behaviors—especially less conventional music behaviors that might be more challenging for adults without specialized training to identify. Early childhood music specialists should emphasize the musical nature and content of children's vocalizations, as vocalizations might be more challenging for adults to identify as music. Support for identifying music behaviors during unstructured playtime might be especially valuable for childcare professionals and parents who may struggle to identify music behaviors, especially when these music behaviors resemble language behaviors. Rather than only providing a specific time for music class, early childhood music specialists might consider participating in side-by-side observations with caregivers and parents to support identification of music behaviors that emerge during free play. In addition, parents and caregivers should consider continuing to develop their personal music abilities and knowledge about music development of young children.

Future researchers should continue to examine adults' abilities to identify music behaviors of young children and the factors that contribute to these abilities. Though Voyajolu and Ockelford (2016) proposed a theoretical framework for the musical development of young children, further research is necessary to determine if such a framework could be used as a guide to develop criteria for identifying music behaviors demonstrated by children. What criteria do adults use to identify music behaviors of young children? Does that criteria change based on factors such as specialized training, parental status, or age of the child? If some adults struggle to identify infants' musical behaviors, what strategies might help them develop these abilities? What support is necessary to help adults identify music behaviors that occur outside of designated music time and that do not conform to conventional music behaviors (e.g. moving to a steady beat or singing songs with lyrics)? Studies comparing criteria of early childhood music teachers, childcare providers, and parents might help paint a broad picture of how adults identify music behaviors of young children and might contribute to future studies regarding strategies to develop adults' abilities to identify music behaviors.

Adults' Interpretations of Musical Behaviors

Continuing the parallel to language acquisition, the next important link in the chain of responsivity is adults' abilities to interpret meaning and intentionality of music behaviors demonstrated by young children. Although researchers have investigated how adults interpret meaning and intentionality of young children's communicative behaviors, they have yet to investigate how adults interpret meaning and intentionality of young children's music behaviors. Like language acquisition researchers, music acquisition researchers use differing definitions of the meaning and intentionality when interpreting infants' music behaviors. Papoušek and

Papoušek (1981) and Gordon (2003) use liberal definitions of music behaviors. Papoušek and Papoušek identify infants' non-crying, quasi-resonant sounds as music behaviors. Gordon (2003) identifies infants' absorption responses (turning toward the source of the music, watching without responding, or moving during silences) as music behaviors. Based on a liberal definition, Gordon (2003) suggests children begin to demonstrate purposeful music behaviors between birth and four-years-old. Researchers have used Gordon's liberal interpretations and his terms "random" and purposeful" to inform their descriptions and analysis of children's music behaviors (Hicks, 1993; Hornbach, 2005; Reynolds, 1995, 2006; Reynolds et al., 2007; Valerio et al., 2006).

Few researchers have examined which types of behaviors adults interpret as meaningful, which types of behaviors adults interpret as intentional, and which factors contribute to these interpretations. Reese (2013) found when adults are asked to categorize music behaviors demonstrated by young children as meaningful or intentional, adults agree that some behaviors seem intentionally musical and others seem musically meaningful but not intentional. The research suggests adults use similar criteria when identifying meaningful and intentional music behaviors, but that meaningful and intentional music behaviors are often discrete.

More research is necessary to determine the criteria adults use when determining what makes music behaviors seem meaningful and what makes them seem intentional. What criteria do adults use to interpret the meaning and intentionality of infants' music behaviors? Does that criteria change based on factors such as specialized training, parental status, or age of the child? As with language acquisition research, a further challenge in synthesizing results of music acquisition studies involves the wide variety of definitions for meaningful and intentional music

behaviors. It might be useful for researchers to develop an agreed upon list of characteristics for meaningful and intentional behaviors that could be used in future research and practice. Future research in this area could examine if there is an "as if" condition in musical contexts that is similar to the "as if" condition in language contexts, and if adults ascribe musical meaning and intentionality to movements and vocalizations of infants. It is compelling to wonder if, as Ryan (1974) and Vedeler (1987) suggest in the case of language acquisition contexts, children are more likely to develop as meaningful and intentional musicians when they are treated as such by adults. Researchers have yet to determine if adults' interpretations of the meaning and intentionality affect the ways in which they choose to respond to and interact with young children in musical contexts. Despite the current lack of research, early childhood music specialists, caregivers, and parents should consider using liberal definitions of music behavior when interpreting children's behaviors, and they should ascribe meaning and intentionality, regardless of whether the behaviors conform to conventional adult-like music behaviors.

Adults' Responses to Music Behaviors

The last link in the chain of responsivity is adults' abilities to respond to music behaviors of young children. Dissanayake (2012) suggests that infants enter the world primed for musical interaction and that infants train adults to respond to them by rewarding adults' music behaviors with sounds and movements. Adults' responses to music behaviors of young children can be divided into two categories: language-based responses and music-based responses. Adults' language-based responses include non-verbal gestures, descriptions of music behaviors, suggestions for new and different ways to make music, corrections of music behaviors, and compliments (Berger & Cooper, 2003; deVries, 2005; Hsee, 2007; Metz, 1989; Young, 2002).

Music-based responses include chanting, singing, moving, improvising, playing an instrument or music recording, and providing silence (deVries, 2005; Hornbach, 2005, 2007; Hsee, 2007; H. Papoušek, 1996; Reynolds, 1995, 2006; Reynolds et al., 2007; Valerio et al., 1998; Valerio et al., 2006; Valerio et al., 2011). The techniques adults use to respond musically to children's music behaviors are similar to those they use when responding to children's communicative behaviors. Adults will imitate and vary music behaviors demonstrated by young children, alter the content and context of music behaviors demonstrated by young children, and extend and repeat music behaviors demonstrated by young children (deVries, 2005; Fox, 1990; Hornbach, 2005; Hsee, 2007; Reynolds, 2006; Reynolds et al., 2007; Tafuri & Villa, 2002; Valerio, 2008; Young, 2005).

Adults' language- and music-based responses seem to influence children's music behaviors (Berger & Cooper, 2003; Custodero et al., 2016 ; Fox, 1990; Hicks, 1993; Hornbach, 2005; Reynolds, 2006; Tafuri & Villa, 2002; Valerio, 2008; Valerio et al., 2006; Valerio et al., 2011). Parents' imitative vocal responses influence the contour of infants' vocalizations (Fox, 1990). Children vocalize more frequently when adults include periods of silence during music interactions and when they improvise musically based on children's music behaviors than when adults' responses lack improvisation and silence (Hornbach, 2005; Reynolds, 2006; Valerio et al., 2006). While some responses seem to encourage and support music behaviors of young children, others adversely affect children's music behaviors. For example, Berger and Cooper (2003) found adults impede children's music behavior when they verbally or physically correct children's musical responses. Similarly, Custodero et al. (2016) found adults often hushed children who were making music in public spaces. In addition, they suggest children may

perceive adults' acknowledgements of their music behaviors as redirections, thus extinguishing their further music behaviors.

With this research in mind, early childhood music specialists, caregivers, and parents should consider responding to children's music behaviors in ways that support development and promote continued music behaviors. In the context of informal and formal music experiences, adults should imitate and extend the behaviors of young children and should include purposeful silence in anticipation of music behaviors from children. Early childhood music specialists should consider providing explicit guidance for caregivers and parents regarding which responses support and which responses extinguish music behaviors of young children.

Future researchers should continue investigating the types and qualities of adults' responses and the effect these responses have on children's subsequent music development. Researchers might consider exploring what makes responses "prompt and contingent" in music contexts. Though language-based responses (e.g. complimenting or describing behaviors) and music-based responses (singing, chanting, moving) might both be considered contingent, they are different and may have different effects on children's subsequent musical behaviors. In addition, studies exploring the long-term effects of adults' responses to music behaviors might contribute to our understanding of how musical skills, attitudes toward music, and music identity develop in children. If researchers discover that some adults struggle to respond contingently and promptly to children's music behaviors, they might explore interventions to help adults develop these abilities.

Conclusions

Children demonstrate communicative and musical behaviors before birth. Early development is socially mediated and influenced by adults' sensitivities—specifically adults' abilities to identify, interpret, and respond to these behaviors through social interaction. Adult-child music interactions (whether in the context of parent-child music classes or childcare settings) are opportunities for the early childhood music specialist to support adults' abilities to identify, interpret, respond to, and support children's music behaviors. While the parent or caregiver's focus is on the child, the music teacher's focus must be on developing the musicianship of the children and the sensitivities of the adults. If adults' sensitivities to infants' communicative behaviors contribute to language acquisition and communicative abilities of infants, perhaps similar sensitivities contribute to music acquisition and musical abilities of infants. Like language acquisition researchers, music aquistion researchers are on a similar path toward understanding ontogenetic music development and adult-child music interactions. Language acquisition research can serve as a map to deeper understanding of the sensitivities that contribute to the musical chain of responsivity. More research is necessary to understand how adults identify, interpret, and respond to music behaviors. Teachers' and parents' abilities to scaffold music acquisition through socially-constructed learning maybe be enhanced by findings of studies examining adults' sensitivity to music behaviors of young children. Especially valuable might be studies that use language acquisition research as a model to examine adults' abilities to identify, interpret, and respond to young children's music behaviors. By connecting to methodological paradigms employed by language acquisition researchers, music acquisition

researchers may contribute new perspectives to our understanding of how adults' sensitivities contribute to music acquisition in young children.

References

Adachi, M. (1994). The role of the adult in the child's early musical socialization: A Vygotskian perspective. *The Quarterly Journal of Music Teaching and Learning, 5*(3), 26-35.

Adamson, L. B. (1995). Communication development during infancy. Dubuque, IA: Brown & Benchmark Publishers.

Adamson, L. B., Bakeman, R., Smith, C. B., & Walters, A. S. (1987). Adults' interpretations of infants' acts. *Developmental Psychology, 23*, 383-387. doi:10.1037/0012-1649.23.3.383

Ainsworth, M. D. S., Bell, S. M., & Stayton, D. J. (1974). Infant-mother attachment and social development: 'Socialization' as a product of reciprocal responsiveness to signals. In M. P. M. Richards (Ed.), *The integration of a child into a social world* (pp. 99-135). Cambridge: Cambridge University Press.

Baumwell, L., Tamis-LeMonda, C. S., & Bornstein, M. H. (1997). Maternal verbal sensitivity and child language comprehension. *Infant Behavior and Development, 20*(2), 247-258.

Berger, A. A., & Cooper, S. (2003). Music play: A case study of preschool children and parents. *Journal of Research in Music Education, 51*(2), 151-165. doi:10.2307/3345848

Bornstein, M. H. (1989). Between caretakers and their young: Two modes of interaction and their consequences for cognitive growth. In M. H. Bornstein & J. S. Bruner (Eds.), *Interaction in human development* (pp. 187-214). Hillsdale, NJ: Lawrence Erlbaum Associations Publishers.

Bornstein, M. H., & Tamis-LeMonda, C. S. (1989). Maternal responsiveness and cognitive development in children. In M. H. Bornstein (Ed.), *Maternal responsiveness: Characteristics and consequences* (pp. 29-61). San Francisco: Jossey-Bass.

Brandt, A., Gebrian, M., & Slevc, R. L. (2012). Music and early language acquisition. *Frontiers in Psychology, 3*, 1-17. doi:10.3389/fpsyg.2012.00327

Bruner, J. S. (1975). The ontogenesis of speech acts. *Journal of Child Language, 2*, 1-19. doi:10.1017/S0305000900000866

Bruner, J. S. (1983). The acquisition of pragmatic commitments. In R. M. Golinkoff (Ed.), *The transition from prelinguistic to linguistic communication* (pp. 27-42). Hillsdale, NJ: Erlbaum.

Burton, S. L. (2002). An exploration of preschool children's spontaneous songs and chants. *Visions of Research in Music Education, 2*, 7-16.

Burton, S. L. (2011). Language acquisition: A lens on music learning. In S. L. Burton & C. C. Taggart (Eds.), *Learning from young children: Research in early childhood music* (pp. 23-38). Lanham, MD: Rowman & Littlefield Education.

Burton, S. L. (2015). Making music mine: The development of rhythmic literacy. *Music Education Research*. Advanced online publication. doi:10.1080/14613808.2015.1095720

Camaioni, L. (1993). The development of intentional communication: A re-analysis. In J. Nadel & L. Camaioni (Eds.), *New perspectives in early communicative development* (pp. 82-96). London: Routledge.

Chen-Haftek, L. (1997). Music and language development in early childhood: Integrating past research in the two domains. *Early Child Development and Care, 130*, 85-97.

Chen-Hafteck, L., & Mang, E. (2012). Music and language in early childhood development and learning. In G. E. McPherson & G. F. Welch (Eds.), *The Oxford handbook of music education* (Vol. 1) (pp. 261-278). New York: Oxford University Press.

Classen, A. W., & Crittenden, P. K. (2000). Maternal sensitivity. In P. M. Crittenden & A. H. Claussen (Eds.), *The organization of attachment relationships: Maturation, culture, and context* (pp. 115-122). London: Cambridge University Press.

Custodero, L. A. (2005). Observable indicators of flow experience: A developmental perspective of musical engagement in young children from infancy to school age. *Music Education Research, 7*(2), 185-209. doi:10.1080/14613800500169431

Custodero, L. A. (2006). Singing practices in 10 families with young children. *Journal of Research in Music Education, 54*(1), 37-56. doi:10.1177/002242940605400104

Custodero, L. A., Calì, C., & Diaz-Donoso, A. (2016). Music as transitional object and practice: Children's spontaneous musical behaviors in the subway. *Research Studies in Music Education, 38*(1), 55-74. doi:10.1177/1321103X15612248

Custodero, L. A., & Johnson-Green, E. A. (2008). Caregiving in counterpoint: Reciprocal influences in the musical parenting of younger and older infants. *Early Childhood Development and Care, 178*(1), 15-39. doi:10.1080/03004430600601115

Demorest, S. M., Morrison, S. J., Beken, M. N., & Jungbluth, D. (2008). Lost in translation: An enculturation effect in music memory performance. *Music Perception, 25*(3), 213-223.

deVries, P. (2005). Lessons from home: Scaffolding vocal improvisation and song acquisition

with a 2-year-old. *Early Childhood Education Journal, 32*(5), 307-312. doi:10.1007/s1064-004-0962-2

DeWolff, M. S., & Van Ijzendoorn, M. H. (1997). Sensitivity and attachment: A meta-analysis on parental antecedents of infant attachment. *Child Development, 68*, 571-591.

Dissanayake, E. (2001). Becoming homo aestheticus: Sources of aesthetic imagination in mother-infant interactions. *SubStance, 30*(1-2), 85-103. doi:10.1353/sub.2001.0005

Dissanayake, E. (2012). The earliest narratives were musical. *Research Studies in Music Education, 34*(1), 3-14. doi:10.1177/1321103X12448148

Elias, G., Meadows, D., & Bain, J. D. (2003). Agreement between mothers and fathers on the identification of infant communicative acts: Use of a randomization procedure. *Infancy*, *4*(2), 219-234. doi:10.1207/S15327078IN0402_04

Fox, D. B. (1990). An analysis of the pitch characteristics of infant vocalizations. *Psychomusicology, 8*(1), 21-30. doi:10.1037/h0094161

Goldstein, M. H., King, A. P., & West, M. J. (2003). Social interaction shapes babbling: Testing parallels between birdsong and speech. *Proceedings of the National Academy of Sciences, 100*(13), 8030-8035.

Goldstein, M. H., & Schwade, J. A. (2008). Social feedback to infants' babbling facilitates rapid phonological learning. *Psychological Science, 19*(5), 515-523. doi:10.1111/j.1467-9280.2008.02117.x

Gordon, E. E. (2003). *A music learning theory for newborn and young children*. Chicago: GIA.

Gros-Louis, J., West, M. J., Goldstein, M. H., & King, A. P. (2006). Mothers provide differential feedback to infants' prelinguistic sounds. *International Journal of Behavioral Development, 30*(6), 509-516. doi:10.1177/0165025406071914

Harding, C. (1984). Acting with intention: A framework for examining the development of the intention to communicate. In L. Feagans, C. Garvey, & R. Golinkoff (Eds.), *The origins and growth of communication* (pp. 123-135). Norwood, NJ: Ablex Publishing Corporation.

Harding, C. G., & Golinkoff, R. M. (1979). The origins of intentional vocalizations in prelinguistic infants. *Child Development, 50*, 33-40. doi:10.2307/1129038

Hendricks, K. S., & McPherson, G. E. (2010). Early stages of musical development:

Relationships between sensory integration dysfunction, parental influence, and musical disposition of a three-year-old 'maestro.' *International Journal of Music Education, 28*(1), 88-103. doi:10.1177/0255761409351353

Hicks, W. K. (1993). *An investigation of the initial stages of preparatory audiation* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (AAT No. 9316493)

Hornbach, C. M. (2005). *Ah-eee-ah-eee-yah-eee, bum and pop, pop, pop: Teacher initiatives, teacher silence, and children's vocal responses in early childhood music classes* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (AAT No. 3189669)

Hornbach, C. M. (2007). The use of silence in eliciting student responses in early childhood music classes. In K. Smithrim & R. Upitis (Eds.), *Research and practice in early childhood music* (Vol. 3, pp. 228-242). Waterloo, Ontario: Canadian Music Educators Association.

Howe, M. J. A., Davidson, J. W., Moore, D. G., & Sloboda, J. A. (1995). Are there early childhood signs of music ability? *Psychology of Music, 23*, 162-176.

Hsee, Y. (2007). *Music interactions among infants/toddlers and early childhood teachers: The role of intervention of early childhood teachers' scaffolding of young children's music learning* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (AAT No. 3284940)

Ilari, B. (2009). Musical interactions in early life. In J. Kerchner & C. Abril (Eds.), *Musical experience in our lives: Things we learn and meanings we make* (pp. 21–38). Lanham, MD: Rowman & Littlefield.

Ilari, B. (2016). Music in the early years: Pathways into the social world. *Research Studies in Music Education, 38*(1), 23-39. doi:10.1177/1321103X16642631

Kamel, H., & Dockrell, J. E., (2000). Divergent perspectives, multiple meanings: A comparison of caregivers' and observers' interpretations of infant behaviour. *Journal of Reproductive and Infant Psychology*, *18*(1), 41-60. doi:10.1080/02646830050001672

Kaye, K. (1979). Thickening thin data: The maternal role in developing communication and language. In M. Bullowa (Ed.), *Before speech: The beginning of interpersonal communication* (pp. 191-206). Cambridge: Cambridge University Press.

Kaye, K. (1982). *The mental and social life of babies*. Chicago: The University of Chicago Press.

Kaye, K., & Charney, R. (1980). How mothers maintain "dialogue" with two-year-olds. In D. R. Olson (Ed.), *The social foundations of language and thought: Essays in honor of Jerome S. Bruner* (pp. 211-230). New York, NY: W. W. Norton & Company.

Kelley, L., & Sutton-Smith, B. (1987). A study of infant musical productivity. In J. C. Peery, I. W. Peery, & T. W. Draper (Eds.), *Music and child development* (pp. 35-53). New York, NY: Springer-Verlag.

Koops, L. (2014). Songs from the car seat: Exploring the early childhood music-making place of the family vehicle. Journal of Research in Music Education, 62 (1), 52-65. doi:10.1177/0022429413520007

McMullen, E. & Saffran, J. R. (2004). Music and language: A developmental comparison. *Music Perception, 21*(3), 289-311. doi:10.1525/mp.2004.21.3.289

Meadows, D., Elias, G., & Bain, J. (2000). Mothers' ability to identify infants' communicative acts consistently. *Journal of Child Language, 27*, 393-406.

Metz, E. (1989). Movement as a musical response among preschool children. *Journal of Research in Music Education, 37*(1), 48-60. doi:10.2307/3344952

Miller, L. B. (1986). A description of children's music behaviors: Naturalistic. *Bulletin of the Council for Research in Music Education, 86*, 1-17.

Miller, C. (1988). Parents' perceptions and attributions of infant vocal behaviour and development. *First Language, 8*, 125-142.

Moog, H. (1976). The development of musical experience in children of pre-school age. *Psychology of Music, 4*, 38-45. doi:10/1177/030573567642005

Moorehead, G. E., & Pond, D. (1942/1978). *Music of young children.* Pillsbury Foundation for Advancement of Music Education: Santa Barbara, CA.

Murray, L., & Trevarthen, C. (1986). The infant's role in mother-infant communications. *Journal of Child Language, 13*, 15-29. doi:10.1017/S0305000900000271

Nelson, K. (1973). Structure and strategy in learning to talk. *Monographs of the Society for Research in Child Development, 149*(1-2), 1-135. doi:10.2307/1165788

Oller, D. K., Eilers, R. E., & Basinger, D. (2001). Intuitive identification of infant vocal sounds by parents. *Developmental Science, 4*(1), 49-60. doi:10.1111/1467-7687.00148

Paavola, L., Kemppinen, K., Kumpulainen, K., Moilanen, I., & Ebeling, H. (2006). Maternal sensitivity, infant co-operation and early linguistic development: Some predictive relations. *European Journal of Developmental Psychology, 3*(1), 13-30. doi:10.1080/17405620500317789

Paavola, L., Kunnair, S., & Moilanen, I. (2005). Maternal responsiveness and infant intentional communication: Implications for the early communicative and linguistic development. *Child: Care, Health & Development, 31*(6), 727-735. doi:10.1080/17405620500317789

Papoušek, M. (1995). Origins of reciprocity and mutuality in prelinguistic parent-infant "dialogues." In I. Markova, C. F. Grauman, & K. Foppa (Eds.), *Mutualities in Dialogue* (pp. 58-81). London: Cambridge University Press.

Papoušek, H. (1996). Musicality in infancy research: Biological and cultural origins of early musicality. In I. Deliege and J. Sloboda (Eds.), *Musical beginnings: Origins and development of musical competence* (pp. 37-55). New York, NY: Oxford.

Papoušek, M. (1996). Intuitive parenting: A hidden source of musical stimulation in infancy. In I. Deliege and J. Sloboda (Eds.), *Musical beginnings: Origins and development of musical competence* (pp. 88-112). New York, NY: Oxford.

Papoušek, M., & Papoušek, H. (1981). Musical elements in the infant's vocalization: Their significance for communication, cognition, and creativity. In L. P. Lipsitt (Ed.), *Advances in infancy research* (Vol. 1, pp. 164-225). Norwood, NJ: Ablex.

Papoušek, H., & Papoušek, M. (1987). Intuitive parenting: A dialectic counterpart to the infant's integrative competence. In J. Osofsky (Ed.), *Handbook of infant development* (2nd ed., pp. 669-720). New York, NY: John Wiley & Sons.

Pond, D. (1981). A composer's study of young children's innate musicality. *Bulletin of the Council for Research in Music Education, 68*, 1-12.

Reese, J. (2013). Adult identification of young children's music behaviors. *Bulletin for the Council of Research in Music Education. 198*, 51-67.

Reynolds, A. M. (1995). *An investigation of movement responses performed by children 18 months to three years of age and their caregivers to rhythm chants in duple and triple meters* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (AAT No. 9527531)

Reynolds, A. M. (2006). Vocal interactions during informal early childhood music classes. *Bulletin of the Council for Research in Music Education, 168*, 35-49.

Reynolds, A. M., Long, S., & Valerio, W. H. (2007). Language acquisition and music acquisition: Possible parallels. In K. Smithrim & R. Upitis (Eds.), *Research and practice in early childhood music* (Vol. 3, pp. 211-227). Waterloo, Ontario: Canadian Music Educators Association.

Reynolds, G. E. (1960). *Environmental sources of musical awakening in preschool children.* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (AAT No. 6003983)

Ryan, J. (1974). Early language development: Towards a communicational analysis. In M. P. Richards (Ed.), *Integration of a child into a social world* (pp. 185-213). Cambridge: Cambridge University Press.

Saffran, J. R. (2003). Musical learning and language development. In G. Avanzini, C. Faienza, D. Minciacchi, L. Lopez, & M. Majno (Eds.), *The annals of the New York Academy of Sciences* (Vol. 999, pp. 397-401). New York, NY: The New York Academy of Sciences.

Saffran, J. R., Johnson, E. K., Aslin, R. N., & Newport, E. L. (1999). Statistical learning of tone sequences by human infants and adults. *Cognition, 70*, 27-52. doi:10.1016/S0010-0277(98)00075-4

Scoville, R. (1984). Development of the intention to communicate: Eye of the beholder. In L. Fegans, C. Garvey, & R. Golinkoff (Eds.), *The origins and growth of communication* (pp. 109-122). Norwood, NJ: Ablex Publishing Corporation.

Shelley, S. (1981). Investigating the musical capabilities of young children. *Bulletin of the Council for Research in Music Education, 68*, 26-34.

Sims, W. (1986). The effect of high versus low teacher affect and passive versus active student activity during music listening on preschool children's attention, piece preference, time spent listening, and piece recognition. *Journal of Research in Music Education, 34*(3), 173-181. doi:10.2307/3344747

Snow, C. E. (1989). Understanding social interaction and language acquisition: Sentences are not enough. In M. H. Bornstein & J. S. Bruner (Eds.), *Interaction in human development* (pp. 83-103). Hillsdale, NJ: Lawrence Erlbaum Associations Publishers.

Stern, D. N. (1985). *The interpersonal world of the infant: A view from psychoanalysis and developmental psychology.* New York, NY: Basic Books.

Suthers, L. (2001). Toddler diary: A study of development and learning through music in the second year of life. *Early Childhood Development and Care, 171*, 21-32. doi:10.1080/0300443011710103

Tafuri, J., & Villa, D. (2002). Musical elements in the vocalisations of infants aged 2-8 months. *British Journal of Music Education, 19*(1), 73-88. doi:10.1017/S0265051702000153

Taggart, C. C. (2011). Response to Edwin Gordon's "Early childhood music abuse: Misdeeds and Neglect". *Visions of Research in Music Education, 17*. Retrieved from http://www--usr.rider.edu/vrme~/

Tomasello, M. (1992). The social bases of language acquisition. *Social Development, 2*, 67-87. doi:10.1111/j.1467-9507.1992.tb00135.x

Trehub, S. E., Trainor, L. J., & Unyk, A. M. (1993). Music and speech processing in the first year of life. *Advances in Child Development and Behavior, 24*, 1-35. doi:10.1016/S0065-2407(08)60298-0

Trevarthen, C. (1977). Descriptive analyses of infant communicative behaviour. In H.R. Schaffer (Ed.), *Studies in mother-infant interaction* (pp. 227-270). London: Academic Press.

Trevarthen, C. (2002). Origins of musical identity: Evidence from infancy for musical social awareness. In R. Raymond, D. Hargreaves, & D. Miell (Eds.), Musical identities (pp. 21-38). Oxford: Oxford University Press.

Trevarthen, C., & Hubley, P. (1978). Secondary intersubjectivity: Confidence, confiding and acts of meaning in the first year. In A. Lock (Ed.), *Action, gesture and symbol* (pp. 183-230). London: Academic Press.

Valerio, W. (1998). Music play = Music immersion at the University of South Carolina. *Early Childhood Connections, 4*(2), 16-19.

Valerio, W. H. (2008). From the teachers' view: Observations of toddlers' musical development. In J. L. Kerchner & C. R. Abril (Eds.), *Musical experience in our lives: Things we learn and meanings we make* (pp. 39-38). Lanham, MD: Rowman & Littlefield Education.

Valerio, W. H., & Freeman, N. K. (2009). Pre-service teachers' perceptions of early childhood music teaching experiences. *Bulletin of the Council for Research in Music Education, 181*, 51-69.

Valerio, W. H., Reynolds, A. M., Grego, J., Yap, C. C., & McNair, A. (2011). Parents' documentation of their young children's music behaviors. In S. L. Burton & C. C.

Taggart (Eds.), *Learning from young children: Research in early childhood music*. Lanham, MD: Rowman and Littlefield Education in association with MENC. Lanham: MD.

Valerio, W. H., Seaman, M. A., Yap, C. C., Santucci, P. M., & Tu, M. (2006). Vocal evidence of toddler music syntax acquisition: A case study. *Bulletin of the Council for Research in Music Education, 170*, 33-45.

Valerio, W. H., Reynolds, A. M., Morgan, G. B., McNair, A. A., (2012). Construct validity of the children's music-related behavior questionnaire. *Journal of Research in Music Education, 60*(2), 186-200. doi:10.1177/0022429412444450

Vedeler, D. (1987). Infant intentionality and the attribution of intentions to infants. *Human Development, 30*, 1-17. doi:10.1159/000273131

Voyajolu, A., & Ockelford, A. (2016). Sounds of intent in the early years: A proposed framework of young children's musical development, *Research Studies in Music Education, 38*(1), 93-113. doi:10.1177/1321103X16642632

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge: Harvard University Press.

Wilcox, M. J., Kouri, T. A., & Caswell, S. (1990). Partner sensitivity to communication behavior of young children with developmental disabilities. *Journal of Speech and Hearing Disorders, 55*, 679-693. doi:10.1044/jshd.5504.679

Williams, K. E., Barrett, M. S., Welch, G. F., Abad, V. & Broughton, M. (2015). Associations between early shared music activities in the home and later child outcomes: Findings from the longitudinal study of Australian children. *Early Childhood Research Quarterly, 31*, 113-124. doi:10.1016/j.ecresq.2015.01.004

Young, S. (2002). Young children's spontaneous vocalizations in free-play: Observations of two- to three-year-olds in a day-care setting. *Bulletin of the Council for Research in Music Education, 152*, 43-53.

Young, S. (2003). *Music with the under-fours.* New York, NY: Routledge.

Young, S. (2004). Young children's spontaneous vocalizing: Insights into play and pathways to singing. *International Journal of Early Childhood, 36*(2), 59-74. doi:10.1007/BF03168200

Young, S. (2005). Musical communication between adults and young children. In D. Miell, R.

MacDonald, & D. J. Hargreaves (Eds.), *Musical communication* (pp. 281-299). New York, NY: Oxford University Press.

Young, S. (2016). Early childhood music education research: An overview. *Research Studies in Music Education, 38*(1), 9-12. doi:10.1177/1321103X16640106

Young, S., Street, A., & Davies, E. (2007). The music one-to-one project: Developing approaches to music with parents and under-two-year-olds. *European Early Childhood Education Research Journal, 15*(2), 253-267. doi:10.1080/13502930701321675

Zeedyk, M. S. (1997). Maternal interpretations of infant intentionality: Changes over the course of infant development. *British Journal of Developmental Psychology, 15,* 477-493. doi:0.1111/j.2044-835X.1997.tb00742.x

Zlochowder, A. J., & Cohn, J. F. (1996). Vocal timing in face-to-face interaction of clinically depressed and nondepressed mothers and their 4-month-old infants. *Infant Behavior and Development, 19*, 371-374. doi:10.1016/S0163-6383(96)90035-1

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