



Keep a Beat! Teachers Using Music to Promote Infant Self-Regulation and Infant-Teacher Social-Emotional Competence

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Abstract

According to the Centers for Disease Control, Louisiana ranks 2nd in the nation for babies born to single mothers and has one of the highest infant mortality rates in the United States. Infants have critical developmental milestones, including needing sustained positive interactions with one or more primary caregivers. If a parent of an infant does not have the resources to provide the nurturing and healthy interactions needed, such as is the case with many Louisiana families, the infant may be at risk for attachment disorders and long-term emotional and behavioral problems. As economic and emotional stressors of home life increase for families in Louisiana, the responsibility of infant nurturing and bonding with a significant caregiver often becomes the responsibility of an early childhood care center infant teacher. Music used as a developmentally appropriate interactive strategy, specifically when primary caregivers provide familiar and live musical with rhythmic interactions with infants, is supported in the literature that infants need these music interactions for attention, arousal, social cognition, physical growth, and emotional behavior competence. The Keep a Beat (KaB) infant classroom curriculum described in this article is theoretically grounded in child-centered music development and was created in collaboration across academic disciplines and community-based sites. Once scaled, KaB has the potential to transform how early childhood teachers in Louisiana and across the United States by supporting infant social-emotional competence, communication, motor skills, and cognition with an evidence-based and developmentally appropriate music curriculum.

Keywords: *Early childhood, infants, parents, teachers, music, stress, self-regulation, social-emotional competence*

Infant Classrooms and Curriculum Challenges

The state of infant curriculum in early childhood education schools in the United States has evolved significantly in recent years, reflecting a growing recognition of the critical importance of early childhood education. A shift to a holistic approach in infant classrooms fosters foundational skills, such as critical thinking, collaboration, and communication [1,2]. Infant teachers' knowledge and effective use of teaching strategies that support the curriculum domain of social-emotional development are vital for infants (ages 0-1) whose brains and bodies are at critical and vulnerable stages of development. Infants from families that are considered at risk, due to limited access to social supports and other resources, are particularly vulnerable to not receiving the social-emotional interactions necessary for healthy development and may be at risk for attachment disorders and long-term behavioral health concerns [3,4,5].

Health disparities for young children and families in the state of Louisiana in the United States are well-documented. According to the Centers for Disease Control (CDC), Louisiana ranks 2nd in the nation for babies born to single mothers and has one of the highest infant mortality rates in the country [6]. While state and regional healthcare systems in Louisiana work to help meet the needs of families, experts say that for infants to thrive, the home environment must be healthy physically and emotionally [7]. Infants have critical developmental milestones, and if a primary caregiver doesn't have the resources to provide the nurturing and healthy interactions needed, infants become at risk for attachment disorders and long-term emotional and behavioral problems. As stresses of home life increase for families in Louisiana, the responsibility of infant nurturing and bonding with a significant caregiver often becomes the responsibility of early childhood care center teachers, providers, and other public health professionals [8].

Early childhood education centers in the city and surrounding areas of Baton Rouge, Louisiana are challenged with limited financial resources, teachers with varied educational experiences, high rates of staff turnover, and fluctuating state financial support. Although there are state standards for



infant classrooms, the level of care varies. Infant teachers in particular experience a very stressful work environment, especially when faced with infants of different temperaments, sleep/feed/wake schedules, and varying social-emotional needs [8,9].

Due to recent efforts by the Louisiana Department of Education (LDOE) to provide financial incentives for low-income families to enroll their children in early childhood education schools, the census and children enrolled with significant developmental delays in many preschools in the greater Baton Rouge area has dramatically increased. Because of the increase in the census and with the required focus on LA Early Learning Guidelines (ELGs) in the areas of social and emotional, communication/language, cognition, and motor development, Baton Rouge early childhood education center directors are eager to partner and have their teachers learn innovative strategies and implement them in the classes [8,9,10].

Music Interactions with Infants Promote Healthy Outcomes

For children ages 0-4, music is inherent to who they are! As infants, they experience their whole world through music such as the steady heartbeat in the womb, the lyrical sounds of the mother's voice, the steady rhythmic movement of rocking, and the beautiful sounds of lullabies provide an infant a safe and nurturing place [11]. For example, premature babies in the Neonatal Intensive Care Unit have increased oxygen saturation learn to suck to eat when given a reward of hearing their mother's voice when singing a lullaby [12]. As children grow, they move to music, learn to communicate with music, and begin understanding their world cognitively with music. Brain research shows how the tempo and frequency of music change brain structures promoting neural plasticity and counteracting the release of cortisol during extremely stressful events for children. Music-based experiences activate many areas of the brain related to social-emotional behaviors, communication, motor, and cognitive processes [13].

The K-12 music education curriculum is well-established and robust in the United States. Music goals are a part of almost every state elementary school curriculum in the country, as the research does show that students who participate in music activities and learn music are more apt to have higher achievement in other academic Science Technology Engineering Mathematics (STEM) areas and adjust better socially in groups [14]. The evidence is not as robust, however, regarding how music instruction can support the early childhood education domains and competencies for curriculum for children ages 0-4 years old.

Just as with other areas of functioning, infants 0-1 have music developmental milestones that if known can help guide a teacher who uses music to interact with them and have enriching music-based experiences that will support their overall development [15]. While there are many benefits to music interactions with infants and music strategies can easily be incorporated throughout the day for infants to support all domain areas, an effective and safe infant/teacher-centric music curriculum has not yet been created or tested for feasibility in infant classrooms [11,12,13,14,15].

The Keep a Beat Infant Classroom Curriculum

The Keep a Beat (KaB) infant classroom curriculum is theoretically grounded in child-centered music development and was created in collaboration across academic disciplines and community-based sites [16,17,18,19, 20, 21, 22]. Once scaled, KaB has the potential to transform how early childhood teachers support infant social-emotional competence, communication, motor skills, and cognition with an evidence-based and developmentally appropriate music curriculum.

The current phase of the KaB infant classroom curriculum development is to document the feasibility and impact of the KaB music curriculum on stress and social-emotional competence of infants and infant teachers in select early childhood education centers in Baton Rouge, Louisiana. Using a pre-test/post-test randomized control trial pilot study research design, the KaB team is expecting to gain knowledge of how feasible it is to implement this type of study in 8 infant classrooms and about proof of concept with the KaB curriculum. The pilot should also help the team develop and define a mechanism of change that will set the foundation to scale up the KaB program to many early childhood schools across Louisiana and create a framework for a larger multi-site research study.

The KaB core curriculum knowledge competency areas include music elements, benefits of music, infant music development, music play, music techniques, and music protocols. Core music knowledge and skill application areas include pulse, tempo, dynamics, rhythm above pulse, chant, humming, and singing. Core knowledge and skill application of KaB techniques include providing



pauses, repetition, changing tempo, changing dynamics, and mirroring the musical behaviors of the infant as needed when interacting with an infant [16, 17, 19, 21, 22, 23, 24].

The KaB training program for teachers spans eight weeks and involves a combination of online curriculum, hands-on implementation, and supervision. In the first week, teachers complete a self-report questionnaire, the Ages and Stages Questionnaire for Social-Emotional Competence for each infant and participate in a group KaB training session. During the second week, teachers engage with online curriculum assignments, implement KaB strategies with infants, document their daily use of these strategies, and receive supervision and feedback from a KaB trainer at the school twice during the week. This pattern of online assignments, strategy implementation, documentation, and bi-weekly supervision continues through weeks three to five, with a midpoint assessment including saliva samples and the Perceived Stress Scale (PSS-10) [25] administered in week five.

In weeks six and seven, the routine of completing online assignments, implementing strategies, documenting usage, and receiving bi-weekly supervision continues. By week eight, teachers not only continue their regular activities but also complete final assessments, including saliva samples, the PSS-10 measures, the Ages and Stages Questionnaire for Social-Emotional Competence [26] for each infant, and a post-study survey evaluation. The online training resources provided throughout the program include group sharing and discussion boards, shared videos of techniques, individual resources from supervisors, and slide presentations with embedded video examples and quizzes. The supervision is tailored to each teacher, focusing on individualized core learning training plans.

Fidelity measures for the project include which of the concepts learned by teachers were implemented in the classrooms. The teacher competency checklist will be completed by each teacher's Keep a Beat trainer. Data on how often each teacher delivered the curriculum during the week and what types of music experiences they used from the curriculum will also be reported by each teacher at the end of each week during the study. Not only will this information help keep track of what strategies are used the most, but it will also help inform the trainer about how best to tailor the subsequent weeks of curriculum strategies for each teacher.

Future Research, Funding, and Implications

In addition to a multi-site scale-up, other follow-up studies could potentially address the following research questions: (Follow-up study of childcare centers.) How do characteristics such as frequency, duration, or intensity of the music curriculum relate to individual or program-level outcomes?; (Follow-up longitudinal) How do changes in outcomes vary by age, socioeconomic characteristics, other demographic and behavioral patterns, and/or health status? and, (Follow-up program Evaluation) What is the comparative cost-effectiveness of a music-based intervention as compared to one or more non-arts-based interventions?

Statewide and national funding agencies with a focus on early childhood mental health could be funders for evidence-based, cost-effective strategies. External large grant funding agencies such as the National Institutes for Health (NIH) have recently joined with the National Endowment for the Arts (NEA) to create several calls for Music and Health research. The National Endowment for the Arts continues to have Research Grants and Research Lab Opportunities. Applying for these opportunities is an integral part of scaling up the project for multi-site study.

With the rise of unstable or absent health family support systems for infants in Baton Rouge and the need for the infant teacher to step in to provide sustained attachment, evidenced-based child-centered strategies that could support early development, such as music, could potentially transform an already stressful environment of an early childhood center infant classroom into a less stressful and engaging environment. While there are many benefits to music interactions with infants, in addition to teaching evidence-based strategies the curriculum should also provide information and effective ways to provide safe music-based experiences that consider the potential for adverse effects of the music, such as overstimulation or hearing damage.

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